BLUE LIGHT and Eye Injury

PLUS: Winterize Your Immune System
Dear Supporter,

It's hard to imagine that Life Extension® is on the verge of 40 consecutive years of scientific publication.

What drove us in 1980 remains our passion today: unparalleled innovation, meticulous research and a science-based approach to developing premium nutrient formulations.

This pioneering spirit continues, as there are exciting changes happening with the Life Extension® brand.

Go to our new website and you’ll see. It’s easier than ever to navigate, making it quicker to find the information you need to live your healthiest life.

Our team understands that when you put supplements into your body, you should be confident that they’ll provide the expected benefits. That is why owners of commercial companies so often choose Life Extension® for their personal use.

As you can see in this month’s magazine, we’ve developed a new look, including a fresh new logo that ties all we do together. You’ll see it on everything—from delivery boxes to catalogs and emails.

Even our bottles have an evolutionary modern look. While you may continue to receive our prior bottles as we transition our branding, rest assured that they’ll be the same, premium supplements we’ve always stood behind.

I hope you’ll like all you will see, including this latest evolution of Life Extension® Magazine.

For longer life,

William Faloon, Co-Founder Life Extension®
What began in 1980 as a science newsletter has since evolved into one of the world's leading organizations devoted to healthy living.

Our mission is to translate science into practical approaches and empower our customers with the information they need to live their healthiest lives.

Innovation is ever evolving and so are we.

This month's Life Extension® Magazine launches a new look, along with graphic changes to our logo, our packaging and more.

EVERYTHING WE DO BEGINS WITH YOU

SCIENCE & RESEARCH IS OUR PASSION

EVERY EVOLVING INNOVATION
In order to make our website more informative and valuable, we have completely overhauled it. Our new Health Basics pages will help you find science and research, as well as products. You will find the navigation intuitive with content and products easy to find.

1. **Products** – Your gateway to all our products and services.
2. **NEW Health Basics** – A great place to start.
3. **Science & Research** – Delve deep into our research and education.
4. **About Us** – Why we’re different, our story, our research and news, plus our store.

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50 HOW SAGE PROTECTS BRAIN FUNCTION
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60 MAGNESIUM AND CARDIOVASCULAR RISK FACTORS
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9 AS WE SEE IT
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Cucumbers’ high content of water, fiber, and caffeic acid rejuvenate skin and support healthy blood sugar and immunity.
Most Complete Omega-3
FISH OIL FORMULA

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

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

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

Xiaoxi Wei, PhD, is a chemist, expert in supramolecular assembly and development of synthetic transmembrane nanopores with distinguished selectivity via biomimetic nanoscience. She has expertise in ion channel function and characterization. She founded X-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.
Folate helps maintain homocysteine levels within the normal range, thereby promoting cardiovascular health. Folate also supports neurotransmitter synthesis—which, in turn, helps maintain cognitive abilities.

However, not everyone has sufficient activity of the enzyme required to convert folate to its biologically active form, 5-methyltetrahydrofolate, or 5-MTHF. 5-MTHF requires no enzymatic conversion to become metabolically active—providing maximum support for both cardiovascular and cognitive health.

Optimized Folate provides metabolically active 5-MTHF folate in 1,000 mcg or 5,000 mcg strengths.

References
Unhealthy “Gummy” Vitamins

The fastest growing segment of the supplement industry is chewable “gummies.”

Consumers view candy-like “gummies” as a pleasant way to obtain nutrients without swallowing pills.

But what’s in these gummies that enables vitamins and fish oil to taste so good?

The answer is loads of sugar with tiny amounts of nutrients.

Sales of sugar-laden chewables have grown to the point that advertisements for gummies have appeared on CBS News 60 Minutes. This is expensive airtime often occupied by prescription drug ads.

On a visit to a local drug store, I observed striking labels for these gummy nutrients. I bought some to find out how they deliver meaningful potencies in a decent taste.

What I read on their labels was appalling. The nutrient potencies were outrageously small. The sugars contained in the gummies add to this nation’s deadly glycemic burden.

Miniscule Potency

A review of a popular gummy product shows that the daily serving provides 47 mg of omega-3s, small amounts of vitamins, minerals, and 4,000 mg of sugar.

Minimum effective doses of omega-3s are thought to be around 1,000 mg a day. Our daily recommendation is over 2,000 mg of EPA/DHA.

Ingesting 47 mg of omega-3s will not make much of an impact. Yet people using this product will assume they are supplementing with omega-3s in effective amounts, which may be a lethal misconception.

My concern is with surveys that ask consumers if they supplement with omega-3s. Users of omega-3 gummies will likely answer YES.
Foods that rank high on the glycemic scale include starches like white bread and rice along with sugary foods and drinks that spike after-meal glucose levels.

Up to 25% of people who contract lung cancer don’t smoke. Many of these individuals would never touch a cigarette, yet they don’t realize that glucose is also a major cancer risk factor.

Glucose provides fuel for rapidly dividing cancer cells. Insulin is a hormonal stimulator for cellular proliferation. Those who consume high glycemic diets sharply increase their odds of contracting many forms of cancer. Yet an increasing number of health-conscious consumers may be unwittingly harming themselves by relying on sugar-laden “gummies” as dietary supplements.

Sugar addiction is a centuries-long problem whose adverse health ramifications have come to light over the past several decades.

We’ve published dozens of articles revealing that sugar is not fit for human consumption.

Simply stated, most of us are perfectly capable of maintaining healthy blood glucose levels from a balanced diet that contains no added sugars and only modest amounts of starches.
We were not about to betray our supporters by turning over the meticulous design of our supplements to a corporation whose sole mission is to make money.

We argued that aging humans require comprehensive nutrient formulas and potencies to sustain their lives. Money-driven drug companies don’t care.

**I founded Life Extension® on the principle of using cutting-edge science to keep our supporters alive in good health, and with no upper limit age threshold.**

We accomplish this not only via the nutrients we offer and medications we recommend, but also with the personal assistance we provide to our supporters.

**Our technical advantage comes from relentless interactions with pioneering researchers who are developing methods to counteract human senescence.**

This provides us with knowledge to help circumvent degenerative factors using novel approaches.

---

Sugar sells for about 10 cents a pound, thereby costing virtually nothing to use in foods, beverages, and in “gummy” dietary supplements.

The cost of obtaining standardized EPA/DHA from fish oil is markedly higher than sugar.

A bottle of a popular omega-3 “gummy” retails for $15.99 and provides a trivial 2,000 mg of EPA/DHA in the entire bottle.

A bottle of one of our fish oil softgel supplements (Super Omega-3) costs $24 and provides 72,000 mg of EPA/DHA in the entire bottle.

Consumers using these omega-3 gummies are paying 24 times more for their EPA/DHA.

This popular gummy omega-3 product provides low potencies of some vitamins and minerals whereas our Super Omega-3 contains standardized olive polyphenols with sesame lignans.

Another brand of omega-3 gummies provides 4,200 mg of EPA/DHA in the bottle that retails for $25.99.

This other product costs about 18 times more per milligram of EPA/DHA compared to Super Omega-3.

---

I use our Super Omega-3 here as a reference, but the price differential is similar when comparing these sugar-laden “gummy” omega-3s with virtually any other standardized fish oil softgel formula.

Consumers using these heavily advertised “gummies” are paying outlandish prices per milligram of EPA/DHA while exposing their aging cells to thousands of milligrams of glucose-spiking sugars.

While some nutrients are suitable for use as chewable gummies, this is clearly not the case with multivitamins and fish oil.

To make these nutrients palatable requires loads of sweeteners and potencies so low that they are unlikely to provide benefits.

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**Our Relentless Mission**

I founded Life Extension® on the principle of using cutting-edge science to keep our supporters alive in good health, and with no upper limit age threshold.

We accomplish this not only via the nutrients we offer and medications we recommend, but also with the personal assistance we provide to our supporters.

Our technical advantage comes from relentless interactions with pioneering researchers who are developing methods to counteract human senescence.

This provides us with knowledge to help circumvent degenerative factors using novel approaches.
In This Month’s Issue…

We wear protective sunglasses to shield against solar rays, but few understand that blue-light emitting computer and phone screens also increase the risk of visual damage over time.

This month we are launching a chewable gummy supplement to help protect your eyes against the deleterious effects of blue light emitted from computer and cell phone screens.

These new gummies have no added sugars, though there are trace amounts (under 500 mg) used to deliver the vision-protecting plant extracts.

The article on page 40 of this issue describes the importance of protecting against blue light spectrums that affect our vision today.

An article on page 24 describes fascinating findings showing a combination of probiotics and a prebiotic markedly reduced flu incidence in a group of older individuals.

Your well being is our priority. I urge you to restrict ingestion of sugars (and starches) as more data reveals their devastating health consequences.

For longer life,

William Faloon, Co-Founder
Life Extension Buyers Club

References

Restore Collagen AND Hyaluronic Acid
WITH DELIGHTFUL GUMMIES

Oral ingestion of collagen peptides and hyaluronic acid boosts these rejuvenating factors in normal, aging skin.

Clinical results reveal improved skin elasticity, increased moisture, and a 20% reduction in the depth of eye wrinkles.

The new **Gummy Science™ Youthful Collagen** formula provides clinically studied* doses with daily intake of 4 tasty **chewable gummies**.

No added sugars.

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Item #02304 • 80 gummies

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Research has found that taurine can promote new cell formation in the area of the brain associated with learning and memory.

Taurine also enhances neurites, tiny projections that help brain cells communicate with each other.

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

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N-acetyl-L-cysteine supports healthy levels of glutathione, a molecule utilized by all cells for protection against free radical damage and attacks from foreign compounds.

For full product description and to order N-Acetyl-L-Cysteine, call 1-800-544-4440 or visit www.LifeExtension.com
A ginger-like root extract found in Male Vascular Sexual Support promotes blood flow and supports sexual response. Each capsule provides 100 mg of KaempMax™, which is super-standardized Kaempferia parviflora.

For full product description and to order Male Vascular Sexual Support, call 1-800-544-4440 or visit www.LifeExtension.com
Vitamin C Helps Type II Diabetes Patients with Glycemic and Blood Pressure Control

Supplementation with ascorbic acid (vitamin C) was shown to improve glycemic control and reduce blood pressure in patients with type II diabetes, according to an article in the journal Diabetes, Obesity and Metabolism.*

Researchers conducted a small, randomized, double-blind, placebo-controlled, cross-over study that included 31 patients with type II diabetes, 27 of whom completed the study.

For four months, participants were given capsules containing 500 mg of ascorbic acid twice daily, or a placebo. They all wore continuous glucose monitors for 48 hours and ate standardized meals.

Compared to the individuals who received a placebo, the patients who took the vitamin C supplements showed a significant reduction in glucose levels after meals, and in time spent daily in hyperglycemia.

Researchers also reported that the patients supplemented with vitamin C experienced decreases of 7 mmHg in systolic blood pressure and 5 mmHg in diastolic blood pressure, while those who took a placebo did not.

Editor’s Note: The authors concluded that, “These findings offer evidence for the proposed use of ascorbic acid as an adjunct therapy to improve glycemic and blood pressure control in individuals with type II diabetes.”

* Diabetes Obes Metab. 2019 Mar; 21(3):674-682.
Greater Vitamin A and Carotenoid Intake Linked with Lower Risk of Skin Cancer

An article in *JAMA Dermatology* reported an association between increased intake of vitamin A and carotenoids, and a lower risk of cutaneous squamous cell carcinoma, a type of skin cancer.*

The study included 75,170 women who participated in the Nurses’ Health Study from 1984 to 2012 and 48,400 men enrolled in the Health Professionals Follow-Up Study from 1986 to 2012.

Dietary questionnaires completed upon enrollment and approximately every four years during the studies provided information concerning intake of retinol (vitamin A) and carotenoids from food and supplements, from which average intake was calculated.

Among men and women who were the study’s top 20% consumers of total vitamin A (the sum of retinol and carotenoids according to their vitamin A activity), the risk of acquiring squamous cell carcinoma was 17% lower in comparison with those whose intake was among the lowest 20%.

Editor’s Note: When the nutrients were examined separately, the top 20% consumers of retinol (vitamin A that did not include carotenoid sources), beta-cryptoxanthin, lycopene, and lutein plus zeaxanthin had risks of developing SCC that were 12%, 14%, 13%, and 11% less, respectively, than the odds experienced by people in the lowest group.

* *JAMA Dermatol.* 2019 Jul 31.
Benefits of CoQ10 for Insulin Sensitivity

Results from a clinical trial reported in the *Journal of Research in Medical Sciences* revealed improvements in total antioxidant capacity, insulin sensitivity and blood glucose in women with type II diabetes who were given coenzyme Q10 (CoQ10).*

Thirty-four women with diabetes received 100 mg of CoQ10 and an equal number of diabetic women received a placebo daily for 12 weeks.

At the end of the trial, blood pressure was lower among participants who received CoQ10 in comparison with measurements obtained at the beginning of the intervention. Fasting blood glucose decreased in the CoQ10-supplemented group, and there was an increase of serum CoQ10, antioxidant capacity, catalase activity, and insulin sensitivity.

**Editor’s Note:** The researchers stated that, “Coenzyme Q10 is an important micronutrient that plays a central role in the mitochondrial electron transport chain and protects the body from damage by reactive oxygen species (ROS).”

Curcumin Aids Exercise Tolerance After Heart Failure, Animal Study Shows

The outcome of an animal study suggests that curcumin could help heart failure patients who experience exercise intolerance, an article in the Journal of Applied Physiology reported.*

Using a mouse model of heart failure with reduced ejection fraction (which happens when the heart’s left ventricle muscle does not pump an adequate amount of blood) the researchers gave curcumin to one group of mice daily for 12 weeks, while another group received none.

Additional groups of healthy mice received the same regimens. Exercise capacity, muscle function and enzyme expression in muscle fiber samples were examined before and after treatment.

“We hypothesized that reduced expression of nuclear factor E2-related factor 2 (Nrf2) in skeletal muscle contributes to impaired exercise performance,” the authors stated. “We further hypothesized that curcumin, a Nrf2 activator, would preserve or increase exercise capacity in heart failure.”

Curcumin-treated mice with heart failure experienced improvement in exercise capacity, muscle function, Nrf2 activation, and levels of the antioxidant enzymes heme oxygenase-1 (HO-1) and superoxide dismutase (SOD)2. Curcumin also upregulated Nrf2, HO-1, and SOD2 expression in mice that did not have heart failure, which suggests that curcumin enhances antioxidant defenses in healthy muscle.

Editor's Note: The authors concluded that, “In the present study, we demonstrated that eight weeks of curcumin treatment improved exercise performance, increased whole-body pulling tension, and ameliorated the skeletal myopathy in mice with heart failure with reduced ejection fraction, suggesting a potential application of curcumin in skeletal muscle dysfunction associated with heart failure.”

* J Appl Physiol. 2019; Feb 1;126(2):477-486.
Dual-Layer Tablet for Optimal Cruciferous Benefits

Optimized Broccoli and Cruciferous Blend is an enteric coated, dual-layer tablet providing:

- **Vegetable extracts** (broccoli, watercress, cabbage, rosemary) in one layer.
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Just one dual-layered tablet daily provides potent benefits of fresh young vegetables.

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

Item #02368 - 30 enteric coated tablets

1 bottle $28.50
4 bottles $26.50 each

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Don’t Weight Around

Maintain Optimal Hormone Levels

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

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

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

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

Item #02478
60 vegetarian capsules Two-month supply
1 bottle $36
4 bottles $32 each

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

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

7-Keto® brand is a registered trademark of InterHealth N.I. U.S. Patent 7,199,116.

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Highly Absorbable CURCUMIN

Curcumin Elite™ is a patented extract from turmeric root that provides 45 times greater free curcuminoid bioavailability than standardized turmeric powder.

Curcumin Elite™ contributes to higher blood levels of bioactive curcuminoids that stay in the body longer to provide more health benefits.

Advanced Curcumin Elite™ contains the same optimal 500 mg potency of curcumin with the added benefits of ginger and additional turmeric actives.

45 times Greater Bioavailability
At a Lower Price

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

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

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

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

By Jonathan Randall

Flu can be a killer.

During the most recent flu season, nearly 43 million Americans got sick and 61,200 died.

The number of flu deaths the year before hit a staggering 79,400.¹,²

Colds may seem like a nuisance, but they can also be serious. Colds can develop into pneumonia—especially in those with weakened immune systems.³

Scientists have discovered that a specific blend of probiotics can be effective at preventing flu, colds, and other respiratory infections.

In one study, this probiotic blend reduced the number of flu and flu-like respiratory illnesses by 75% and colds by 39% compared to a placebo.⁴

When flu and colds did occur, this same probiotic blend reduced duration and severity.⁴
The best way to fight against these illnesses is to prevent them in the first place. Frequent hand washing and other measures are important for prevention, but they aren’t perfect. Many people remain prone to flu and colds even after seemingly “doing everything right.”

In searching for a way to prevent these infections, scientists identified specific strains of bacteria known as probiotics.

**How Probiotics Fight Colds and Flu**

**Flu and cold viruses** strike the upper respiratory tract. These are the passageways through which air passes when we breathe, including the nasal cavity and throat.

The membrane lining these spaces and the sinuses is called the respiratory mucosa. This delicate mucosa is prone to invasion by viruses that cause the flu, colds, and other infections (like sinusitis and sore throat).

Healthy bacteria thrive in the secretions lining the mucosa of the upper respiratory tract, just like they do in the gut. There, these beneficial bacteria help to fight harmful viruses and bacteria that cause disease.

The mucosal defense system is a critical immune factor that defends against invasion by disease-causing bacteria and viruses.
But the immune system, including the mucosal defense system, weakens as we age. This makes it easier for viruses to gain a foothold in susceptible tissues.

People with diabetes, cardiovascular disease, chronic lung disease, and other illnesses may also have weakened immune systems, putting them at even higher risk for respiratory tract infections.

Multiple studies show that a carefully chosen blend of probiotics taken orally can boost the mucosal defense, warding off the harmful viruses that cause upper respiratory tract infections like colds and flu.9-12 Most of these probiotic bacteria end up in the gut. But the mucosal defenses they strengthen favorably affect the neighboring respiratory tract as well.9,11 They also help boost general immune function.

**Combined Probiotic and Prebiotic Reduce Illness**

Several small studies and reviews have found that probiotics are better than a placebo at reducing the number of upper respiratory tract infections, as well as the average length of illness, need for antibiotics, and work absences.10,12,13

Inspired by these findings, scientists set out to develop a select blend of probiotics and to design a placebo-controlled study to demonstrate its effectiveness.

They used a mix of five specific strains of healthy probiotic microorganisms: *B. lactis* BS01, *L. plantarum* LP01, *L. plantarum* LP02, *L. rhamnosus* LR04, and *L. rhamnosus* LR05. The blend also included prebiotics called galactooligosaccharides (GOS). Prebiotics are nutrients the probiotic bacteria can digest, supporting their survival and growth.

In a study conducted over 90 days during flu season, 250 healthy, adult volunteers received either the new probiotic-prebiotic blend or a placebo daily.4 The findings were dramatic.

Compared to the placebo, the number of flu and flu-like respiratory illnesses was reduced by 75% with this probiotic-prebiotic blend. The number of colds was reduced by 39%.

While the blend couldn’t prevent all respiratory tract infections, it had clear benefits in those who did develop an illness. It led to a 37% reduction in the severity of flu symptoms and a 19% reduction in the severity of cold symptoms.
The length of these illnesses was also reduced, by about one day on average for colds, about three days for cough, and close to 1.5 days for all acute upper respiratory tract infections.

Summary

Winter and early spring see a huge increase in the incidence of flu, colds, and other upper respiratory tract infections.

Older people are particularly susceptible to respiratory tract infections because they have a lower level of immunity, and they suffer the highest rates of flu-related hospitalizations and death.

Research has found that a specific probiotic blend can boost immunity, particularly bolstering mucosal defenses in the upper respiratory tract.

A specially designed blend of five strains of probiotic bacteria, along with a potent prebiotic to support their survival, has been shown to dramatically reduce the incidence of flu, colds, and other upper respiratory tract infections.

This probiotic-prebiotic blend can also reduce the severity and duration of these illnesses when they occur.

What Are Probiotics and Prebiotics?

Probiotics are healthy microorganisms that contribute to a beneficial blend of microbes in the intestines. They’re mostly various types of health-promoting bacteria.

A prebiotic is a specially chosen micronutrient that supports probiotic survival and health. In other words, it’s “food” for the probiotic organisms.

For example, galactooligosaccharides (GOS) are a specific form of prebiotic that are particularly good at supporting the growth of beneficial gut microbes.

When taken together, a blend of probiotics and a prebiotic provides the best chance for the probiotics to thrive and work optimally.

References

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

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

Item #02004 - 30 vegetarian capsules

1 bottle $33
4 bottles $29 each

Reference

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Zinc stimulates the activity of about 300 enzymes\(^1\) and fortifies the immune system.\(^2\)

Taking a zinc lozenge is important for maintaining the body’s natural defense system when needed. They are not intended for daily use.

**Enhanced Zinc Lozenges** is a special “ionic formula” that delivers on the original promise of seasonal immune support and comes in peppermint flavor.

**References**

For full product description and to order **Enhanced Zinc Lozenges**, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com).
FLORASSIST® Winter Immune Support contains:

- 5 targeted probiotic strains (15 billion CFU)
- 2.5 grams of a specific pre-biotic (galacto-oligosaccharide)

This formula combines a clinically studied blend of probiotic strains and a prebiotic to promote a healthy immune response.

Just mix one stick pack of this unflavored powder into a glass of water, smoothie, or your favorite beverage.

Take daily, especially during the winter when immune defenses should be on high alert.

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

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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.

Item #02234 • 3 mg, 2 fl. oz
1 bottle $9
4 bottles $8.25 each

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

CAUTION: Do not combine with alcohol. Do not attempt to 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.
DNA damage contributes to accelerated aging.\(^1\)

There are many causes of damage to DNA, from normal metabolic processes to external factors like exposure to UV light or radiation.

As we age, the damage accumulates, leading to further, more rapid aging of organs and tissues.

Common disorders with links to DNA damage include cardiovascular, diabetes, inflammatory bowel, autoimmune, and cancer.\(^2\)-\(^11\)

A recent study discovered that coffee protects our DNA, the thin stretches of genetic material packed into virtually every cell in the body.

In the trial, published in late 2018, coffee reduced DNA damage by a significant 23\%.\(^12\)

This new study adds to growing evidence recommending consumption of 2-4 cups of coffee daily to help protect against a host of age-related disorders.

**What the Scientists Studied**

In the study, published in the *European Journal of Nutrition*, researchers reported on a single-blind, randomized, controlled trial examining the effects of moderate coffee consumption on DNA damage in 100 adult coffee drinkers.\(^12\)

All enrolled subjects underwent an initial four-week “preconditioning” period, when coffee and other caffeine-containing beverages were excluded from the diet.
During the following four weeks, subjects were randomly assigned either to a coffee or a warm water consumption group. All participants consumed 500 ml (about four 4-ounce cups) of their assigned beverage daily.

Blood specimens were analyzed for evidence of DNA damage at the end of the preconditioning period, and again at the end of the test period.

**What the Study Showed**

At the end of the study, DNA damage (measured by the amount of broken DNA strands) was reduced by 23% from the start in the coffee group, but remained unchanged in the water control subjects.12

This was true even though the mean level of damage at the start of the study was 16% greater in the coffee group.12

When changes from baseline were analyzed, DNA strand breaks were reduced by 26% in women and by 20% in men, hinting at some biological variability.12

**Summary**

DNA damage is known to contribute to age-associated disorders. Coffee consumption has been linked to a reduction in the risk and severity of many of these diseases.

Now, it has been shown that moderate coffee consumption reduces the amount of DNA damage in men and women, providing insight into another mechanism that links coffee drinking to healthier outcomes.

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

**More Good News on Coffee**

Until recently, coffee was generally considered a “vice” drink, and lumped in with cigarette smoking and alcohol use as having negative health effects—especially on the heart and circulatory system. As this Research Update shows, however, we’re now finding more and more reasons to celebrate—and consume—coffee as part of a normal day’s activities.

A study presented at the British Cardiovascular Society’s annual conference in Manchester, UK, and funded in part by the British Heart Foundation was led by researcher Kenneth Fung.13

Fung’s group studied 8,412 people in the UK, in search of evidence that coffee drinking—especially very high consumption—contributes to arterial stiffening.

When the UK researchers divided their study subjects into three groups, according to daily coffee consumption (less than one, 1-3, and more than 3 cups/day), they found that even in those who consumed five cups of coffee per day—and as many as 25 cups per day—daily coffee consumption did not increase arterial stiffness compared to coffee abstainers.13

In the words of Metin Avkiran, professor and associate medical director of the British Heart Foundation, this result “rules out one of the potential detrimental effects of coffee on our arteries.”13

**References**

Carnosine is a unique dipeptide that can inhibit glycation throughout the body, thereby helping to slow normal aging processes. Suggested dose is one 500 mg Carnosine cap taken twice daily.

Super Carnosine provides 500 mg of carnosine per capsule along with fat-soluble vitamin B1 (benfotiamine) to further impede glycation reactions.

Mitochondrial Energy Optimizer provides 1,000 mg of carnosine in each four-capsule dose along with R-lipoic acid, benfotiamine, taurine, and PQQ to provide broad-spectrum support.

Life Extension® was the first to introduce high-dose (500 mg) carnosine back in 1999.

For full product description and to order Mitochondrial Energy Optimizer, Carnosine or Super Carnosine, call 1-800-544-4440 or visit www.LifeExtension.com

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Higher Potency CARNOSINE

Protect Against Aldehyde Damage

Item #01829 • 60 vegetarian capsules
1 bottle $27
4 bottles $24 each

Life Extension® was the first to introduce high-dose (500 mg) carnosine back in 1999.

Item #02020 • 60 vegetarian capsules
1 bottle $30
4 bottles $27 each

Life Extension carnosine is available in three different formulas to allow you to customize your longevity program.

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

Each formula provides high doses of carnosine to ensure sustained benefits.
COMBAT Senescent Cells and AGING

New Science of Senolytics!

Senescent cells are old cells that no longer divide but they emit factors that accelerate aging.

Senolytic compounds selectively help target senescent cells in the body.

Laboratory studies show evidence of systemic rejuvenation when the senescent cell burden is reduced.

Once-Weekly Senolytic Formula

Senolytic Activator provides a highly absorbable form of quercetin phytosome and black tea theaflavins designed to enhance the body’s ability to manage senescent cells.

The suggested dose is to take two capsules of Senolytic Activator just once weekly.

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

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Most of a coffee bean’s polyphenol content is destroyed during the typical roasting process.

Among the most beneficial of these polyphenols is chlorogenic acid.

Rainforest Blend coffee utilizes the patented Healthy Roast® process, which retains the naturally occurring polyphenols like chlorogenic acid.

**A Patented Organic Roast**

Life Extension® Rainforest Blends are made using a patented, 100% natural process consisting of USDA certified organic arabica coffee beans.

**Savory Taste Without Stomach Upset**

The HealthyRoast® process also preserves special, naturally occurring compounds in coffee that soothe your stomach.

**Tasty Decaf**

Rainforest Blend is also available in a decaffeinated blend. The caffeine is removed through a chemical-free water process. It delivers the full flavor, aroma, and body of the arabica bean.
MacuGuard® Ocular Support provides lutein, trans-zeaxanthin, and meso-zeaxanthin to help maintain structural integrity of the macula and retina.\textsuperscript{1,5}

Alpha-carotene is included based on new evidence that it helps support the macular pigment.\textsuperscript{1}

People supplementing with saffron showed an improvement in vision as measured by their seeing an average of two additional lines on the eye chart commonly used by doctors to test vision.\textsuperscript{1}

This formula provides the optimal dose of saffron along with cyanidin-3-glucoside to support healthy vision.\textsuperscript{6-8}

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

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

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A Complete Multivitamin for Moms and Developing Infants

Prenatal Advantage provides vitamins and key nutrients recommended for about-to-become-pregnant, pregnant, and nursing women to optimally support their baby’s overall health.

Scientifically formulated Prenatal Advantage contains:

- **Choline** and **DHA** (docosahexaenoic acid) to promote healthy brain and eye development.
- **Folic acid** and its most biologically active form, called **5-MTHF**—to support healthy development.
- **Lutien, zeaxanthin,** and other carotenoids for healthy development of the eyes and brain.
- Full spectrum of vitamins and minerals to ensure against deficiencies.

Take 4 softgels daily, in divided doses with meals, ideally beginning in the months leading up to pregnancy, or as directed by a healthcare practitioner.

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

Item #02319 • 120 softgels

1 bottle $21  
4 bottles $18 each

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**CAUTION:** Individuals consuming more than 50 mcg (2,000 IU)/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Vitamin D supplementation is not recommended for individuals with high blood calcium levels. If you are taking Warfarin (Coumadin®) or related medications, consult your healthcare provider before taking the 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.

Screens are everywhere these days. And with them comes a danger that few people are aware of:

Most of them emit high amounts of harmful blue light.\(^1\)

This blue light can cause problems like digital eye strain and insomnia.

Even more worrisome, it can damage the retina, the part of the eye that captures light and sends signals to the brain, allowing you to see.\(^2-7\)

This damage increases the risk for macular degeneration, a leading cause of blindness in older adults.\(^8-11\)

Disconnecting from modern technology isn’t exactly an option.

Fortunately, scientists have discovered that two nutrients, lutein and zeaxanthin, filter out the most dangerous wavelengths of blue light, acting almost like internal sunglasses.

Increasing intake of these plant pigments shields the retina, reducing risk of eye strain and age-related eye disease.\(^12\)

The results can be dramatic: One study found that people with the highest dietary intake of lutein and zeaxanthin had a 41\% lower risk of developing advanced macular degeneration.\(^13\)
Trouble Sleeping

Being exposed to sunlight during the day and darkness at night helps set our circadian rhythm, the natural internal clock that regulates sleep-wake cycles. The sun’s blue light is an important contributor to these circadian rhythms.

But with increasing screen time, we are exposed to intense blue light well into the evening. To our brains, it’s as though the sun is still blazing, even at night.

This dramatic change in light-dark cycles can impair normal circadian rhythms. As a result, the body produces less melatonin at night, leading to difficulty falling asleep and insomnia. This loss of sleep can cause drowsiness and problems with attention and alertness.

Risk for Macular Degeneration

The biggest danger of excess blue-light exposure is that it can permanently damage vision.

When blue-light wavelengths hit the retina, they set off a cascade of chemical reactions that damage photoreceptors, the retinal cells responsible for first detecting light.

This result can be impairment of photoreceptor function and even cell death. Photoreceptors are not yet replaceable, and without them, vision is not possible.

In fact, several studies now confirm that chronic exposure to blue light increases the risk of age-related macular degeneration, a leading cause of blindness.

The Growing Problem of Screen Time

Roughly 96% of Americans own a cellphone. A vast majority also own a desktop or laptop computer, and many have tablets, e-readers, and LED televisions, as well.

These devices are used almost constantly—for work, play, entertainment, and research.

One study found that average users check their smartphones about 52 times per day. And at least two different, recent studies have shown that the average adult in the U.S. spends more than nine hours a day looking at digital media.

The blue light emitted from most of these devices can cause three problems:

Digital Eye Strain

Staring at blue-light-emitting screens for long periods of time can cause digital eye strain, which often manifests as eye pain, dry eyes, headache, and blurred vision.

This condition (once known as computer vision syndrome) is becoming more common as people spend more time looking at screens. A few years ago, it was estimated that 65% of people in the U.S. have symptoms of digital eye strain, and this number is growing.
Preventing Damage

The retina of the eye has a built-in shield to protect photoreceptors from blue-light damage. The retinal pigment epithelium has extremely high concentrations of the carotenoids lutein and zeaxanthin, along with a slightly different form of zeaxanthin called meso-zeaxanthin.3

These pigments help catch and disperse the energy of blue light, significantly reducing the amount that hits the photoreceptors.3,22-25 Carotenoids also have free-radical scavenging and anti-inflammatory properties, further reducing damage that leads to visual deterioration and macular degeneration.3,22,25,26

But there’s a problem: Lutein and zeaxanthin aren’t created in the human body. They’re produced in plants and must be obtained from the diet or by supplementation.27

Modern Western diets are so lacking in carotenoids that the levels of lutein and zeaxanthin in most people’s retinas are far below what are considered optimal to protect vision.27,28

The carotenoids in the retina can be estimated by measuring the macular pigment optical density. (The macula is the central area of the retina.) The higher the density, the more carotenoids present, and more blue light is blocked.

The average macular pigment optical density in people from Western countries is about 0.3. Eye health experts agree that optical density measurements above 0.5 are ideal and most protective against blue-light-induced visual injury.29,30

The good news: Increasing intake of lutein and zeaxanthin directly leads to greater macular pigment optical density.31-38

One study evaluated a carotenoid formula derived from the marigold plant, containing 10 mg of lutein and 2 mg of zeaxanthin isomers (zeaxanthin and meso-zeaxanthin).37 Subjects taking the carotenoids for 12 months saw their macular pigment optical density increase from below the recommended level up to a healthy range, an average of 0.654.

Lutein and Zeaxanthin Protect Your Eyes

Several human studies have shown that increasing intake of lutein and zeaxanthin isomers (zeaxanthin and meso-zeaxanthin) improves visual function by reducing glare, improving contrast sensitivity, and protecting against visual problems associated with bright lights.37-39

Shielding Your Eyes from Blue-Light Damage

- Digital screens emit a high percentage of blue light, a major contributor to digital eye strain, sleep problems, and the development of age-related macular degeneration, a major cause of vision loss in older adults.

- The carotenoid pigments lutein and zeaxanthin are concentrated in the retina of the eye, where they help shield it from the harmful effects of blue light.

- Most people have levels of these carotenoids that are far below what is recommended by doctors for optimal protection.

- Increasing intake of lutein and zeaxanthin from marigold extract has been shown to significantly boost retinal levels of these pigments, protecting against eye strain and reducing the risk for macular degeneration and vision loss.
Even more striking, taking these carotenoids has been shown to slow the progression of age-related macular degeneration and improve visual acuity (the clarity or sharpness of vision) in those who already have symptoms of the disorder.\(^{31,33-35,40,41}\)

One study of 102,000 people aged 50 and older, conducted over 20 years, found that those with the highest intake of lutein and zeaxanthin had a 41% lower risk of progressing to advanced macular degeneration.\(^{13}\)

**Summary**

Digital screens emit a high level of potentially dangerous blue light, which can contribute to eye strain and sleep problems.

They are toxic to cells in the retina of the eye, contributing to loss of vision through age-related macular degeneration.

Carotenoid pigments lutein and zeaxanthin defend against blue-light-induced eye problems. But most people don’t get enough from their diets to provide optimal protection.

A marigold extract has been incorporated into a sugar-free gummy that contains these carotenoids at doses that have proven effective in clinical trials.

**Studies** have shown that increasing intake of these nutrients boosts the eye’s natural defenses against blue light, shielding against eye strain and long-term damage which can lead to macular degeneration. 

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

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**References**


Lab data suggest spearmint polyphenols may promote the growth of new brain cells.¹

Just open a packet, pour Focus Tea™ into hot water, stir, and enjoy. No steeping needed.

Spearmint tea has been shown in human studies to boost:¹

- **Mental focus**
- **Working memory**
- **Concentration**

Lab data suggest spearmint polyphenols may promote the growth of new brain cells.²

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

References

Neumentix™ is a trademark of Kemin Industries, Inc.
SMART PHONES, TVS, AND COMPUTERS
EMIT BLUE LIGHT THAT CAN BE UNFAVORABLE TO HEALTHY VISION.

Digital Eye Support contains a trademarked blend of lutein and zeaxanthin that helps filter out the blue light* bombarding our eyes from digital devices.

Just two gummies a day provide ingredients shown to enhance the protective macula structure to support vision health.

Digital Eye Support comes in a tasty, berry-flavored gummy with no added sugar.

* Blue light is not easily filtered by our eyes and vision experts warn against repeated overexposure.

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

LuteMax® is a registered trademark of OmniActive Health Technologies Ltd.
Keep out of reach of children. Do not exceed recommended dose. When using nutritional supplements, please consult with your physician if you are undergoing treatment for a medical condition or if you are pregnant or lactating.

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.
Caution: Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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A DELICIOUS WAY TO:
• Promote satiety, boost energy
• Support lean muscle mass

CONTAINS:
• 12 grams of Whey Protein
• 12 grams of Fiber
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• 0% Guilt

Item #02146
Chocolate Brownie (12 bars)
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Cookie Dough (12 bars)
1 box $24
As we age, our cognitive abilities decline. But it doesn’t have to be this way. Scientists have identified specific nutrients that protect the aging brain.1-10 One of these is a sage extract that has demonstrated remarkable cognitive-enhancing activities.11 In clinical studies, this sage extract increased memory performance in older adults by nearly 60%. A measure of attention improved by about 2.5-fold—within hours of ingestion.12 In addition to these human benefits, this sage extract has been shown to increase lifespan by 12% in an animal model of aging.11 Together with other nutrients, this sage extract can help our brains function in a more youthful manner.
Preserving Brain Power

Minor deterioration in brain function is known as mild cognitive impairment. It affects memory, attention, and other mental processes.

More severe loss is considered dementia, which includes Alzheimer’s disease.

Alzheimer’s and other forms of dementia are characterized in part by lower levels of the neurotransmitter acetylcholine.

Losing memory and brainpower is not “a part of life” that everyone must endure.

Research has documented that certain nutrients help maximize brain function. The herb sage stands out for its ability to protect neurons and enhance cognitive function.13-18

A team of scientists has identified a new sage extract that provides powerful brain-protective effects not found in other sage preparations.11,12,19

Cognitive Benefits of Sage

Sage is rich in polyphenols that have demonstrated clinical benefits and fascinating preclinical findings.

But the most compelling benefit of sage may be its capacity for cognitive protection.

In a series of clinical trials, scientists found that younger individuals who took sage extract benefited within hours from improved mood, reduced anxiety, enhanced long-term memory, and reduced mental fatigue.13-16

Researchers also documented cognitive benefits in older people with dementia.17,18

In a randomized clinical trial on patients with mild-to-moderate Alzheimer’s, the cognitive scores of a placebo group deteriorated by about 22% over four months. But the scores of the group that supplemented with sage extract improved by about 26%.18

That’s a remarkable result. But even stronger brain protection is available from a new sage extract.

An Improved Form of Sage

A group of European scientists has identified a specific form of sage with benefits that go beyond traditional sage extracts.

This extract has a unique chemical fingerprint,19 one distinctively suited to support brain function.

In fact, this newer sage extract has shown, in preclinical studies, superior effects to other sage sources and to cognitive drugs.11,20

Scientists enlisted adults over age 64 for a clinical study of its effects on cognition.12 Brain function tests were conducted both before and after participants were given either the sage extract or a placebo.

Here are the remarkable findings:12

- Memory performance in those receiving this new sage extract was boosted, compared to placebo, by roughly 60%.
- A measure of attention in sage-supplemented participants was enhanced, compared to placebo, by about 2.5-fold.

These improvements occurred within hours of taking this new sage extract.12
Sage Boosts Brain Power

- Scientists have identified a unique sage extract that increases memory performance in older adults by nearly 60% and improves a measure of attention by 2.5-fold—within hours of ingestion.
- This new extract has neuroprotective capabilities not seen in other sage preparations, and it shows the ability to extend lifespan in animal models of aging by 12%.
- This sage extract can help support brain health, especially if taken with other supplements with proven brain benefits.

How It Works

Life Extension® has collaborated with researchers at a group called Sibelius to determine how this particular extract enhances memory and attention.

Traditional sage helps protect the aging brain and supports cognition by:

- Reversing decreases of the neurotransmitter acetylcholine,12,15-17,21,22 which is critical for attention, memory, and reasoning,23-25
- Boosting levels of neurotrophins,22 proteins that encourage creation of new brain cells and repair of damaged brain cells,26-27 and
- Reducing inflammation22 which is associated with cognitive deficits.28

The new sage extract does all this. But scientists have identified several additional ways that this extract, with its different chemical makeup, may deliver cognitive enhancements.

Improved Lipid Metabolism and Insulin Signaling

In a compelling preclinical analytic study, this unique sage extract was found to increase expression of genes related to lipid metabolism and insulin signaling—which are both tied to enhanced longevity.21 Blood tests in aging adults often reveal dangerous increases in glucose, cholesterol, and triglycerides.

In a model of aging using roundworms, this extract resulted in a 12% lifespan increase. Other sage sources did not extend life.11

Stronger Neurotransmitter Signaling

In addition to the increased acetylcholine levels induced by other sage sources, this extract boosts the activity of other neurotransmitters such as GABA (gamma-aminobutyric acid) and glutamate.21

This helps explain the profound cognitive benefits observed in human studies.

Increased Blood Flow to the Brain

As we age, our brain suffers blood flow reductions due to vascular stiffening and damage to delicate capillary beds.

This new sage extract has vasodilation properties, which means it can open vessels that supply vital blood and oxygen to the brain.21

The age-related reduction of blood flow is a precursor to memory loss and dementia.29-33
Summary

Scientists have identified a unique sage extract that has a biological makeup and neuroprotective effects never seen before.

Clinical evidence demonstrates that, within just hours of ingestion, this extract increases memory performance in older adults and improves measures of attention.

This new extract was also shown to increase lifespan by 12% in an animal model of aging.

Sage offers critical protection against cognitive decline.

Taken with other neuroprotective nutrients, such as phosphatidylserine, blueberry, vinpocetine, pregnenolone, and ashwagandha, it can be part of a multivitamin for the brain.

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


Other Nutrients for Brain Health

Sage

Sage is just one of several nutrients known to protect and enhance brain health. By taking it with others that complement its activity, it can maximize cognitive benefits.

Phosphatidylserine

Phosphatidylserine is an essential phospholipid component of nerve cell membranes and the myelin sheath that covers and protects nerve cells, including brain cells. The myelin sheath supports the conduction of nerve impulses throughout the nervous system.1,34,35

Taking phosphatidylserine preserves cognitive function and may reduce the structural deterioration in the nervous system that occurs with age. In studies, people who took it scored higher on short-term memory and concentration tests.1

Blueberry

Blueberries are packed with anthocyanins, powerful compounds present in a variety of plants including fruits and vegetables. Anthocyanins exert a broad range of health-promoting effects, including defense against oxidative stress, as well as modulation of gene expression and cell-signaling pathways.36

Recent human trials have demonstrated that blueberries improve memory and other cognitive performance in older subjects, and boost mood and cognition in children and young adults.3-5,37,38

Vinpocetine

Vinpocetine, a compound derived from the periwinkle plant, has been reported to have benefits for cognition and degenerative disorders of the brain such as Alzheimer’s and Parkinson’s disease. Vinpocetine helps to dilate (widen) blood vessels to the brain, improving blood flow and stimulating brain metabolism.6

Pregnenolone

Studies in animals and humans have shown that pregnenolone, a hormone produced by the adrenal gland, appears to be a neuroprotectant, defending the brain from various forms of injury.39,40

It has also been found to have positive effects on mood, memory, and other aspects of cognition.7

Ashwagandha

Ashwagandha is an Indian herb, also referred to as “Indian ginseng.” It has been used in traditional Indian medicine as a nerve tonic for thousands of years.

In modern research, ashwagandha has demonstrated neuroprotective effects and improvements in mood and cognition.8,9 One study in patients suffering from mild cognitive impairment found that ashwagandha supplementation led to improvements in memory, attention, and decision making.8


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How MAGNESIUM Lowers Cardiovascular Disease Risk

BY WILLIAM STETON

Cardiovascular disease remains the leading cause of death in the U.S. and worldwide.¹,²

It’s been that way despite billions of dollars spent developing drugs and surgical treatments.

But there’s a simple way to help lower the risk: increasing intake of the mineral magnesium.³,⁴

One large epidemiological study of older men showed that those with the highest magnesium blood levels had a 44% lower risk of heart failure than those with the lowest magnesium levels.⁵

Most Americans fail to consume enough magnesium.

An estimated 64% of all men and 67% of all women are magnesium deficient. After age 71, those magnesium deficient numbers rise to 81% of men and 82% of women.³,⁶

It’s difficult to get enough magnesium from food alone. We also have trouble absorbing magnesium as we age.

Fortunately, supplementation with magnesium can resolve magnesium deficiency, and contribute to improved health and longevity.
Low Magnesium Increases Heart Disease Risk

Magnesium is a mineral involved in approximately 80% of known metabolic functions. Insufficient magnesium in the body means that enzymes required for proper metabolism function poorly or not at all. Many of these enzyme systems serve essential purposes in heart muscle and blood vessels. When they become impaired, the risk of cardiovascular disease rises.

For nearly two decades, scientists have recognized that magnesium intake and magnesium blood levels influence formation of atherosclerosis. Magnesium supplementation can inhibit atherosclerotic plaque formation in animals on high-fat diets.

More recent human studies have revealed strong associations between low magnesium levels and higher heart disease risks. This demonstrates that magnesium can be a powerful protective measure to maintain heart health.

Studies specifically show that the lower the dietary intake of magnesium, the higher the levels of:

- **Chronic, low-grade inflammation.** This is a contributor to most age-related diseases.

- **Endothelial dysfunction.** This occurs when the cells lining blood vessels (endothelial cells) become damaged and initiate and promote formation of artery-blocking lesions.

Chronic inflammation and endothelial dysfunction both raise the risk of cardiovascular disease. Higher magnesium intake correlates with lower blood markers of inflammation and endothelial dysfunction.

An epidemiological study of 3,523 men aged 60-79, with no prior history of cardiovascular disease, demonstrated that risk for heart failure declined steadily with rising magnesium levels. Those with the highest magnesium blood levels had a 44% lower risk of heart failure than those with the lowest levels, mostly due to the reduced markers of inflammation and endothelial dysfunction.

Lab studies also show that, in cultured human endothelial cells, magnesium deficiency activates NF-kB (nuclear factor kappa B). NF-kB is a leading regulator of inflammation in cells and is a major facilitator of atherosclerosis.

What Animal Studies Show

Studies in animals have clearly shown the cardiovascular benefits of magnesium supplementation.

In rats, magnesium deficiency raised blood pressure and thickened major arteries, compared to rats with normal magnesium intake. This effect was most pronounced in older animals. In fact, the magnesium-deficient rats had significantly higher death rates, mostly related to high blood pressure.

On the other hand, rats supplemented with magnesium had lower blood pressure. As a result, they were less likely to die than their magnesium-deficient peers.
And in mice genetically prone to very high cholesterol levels, magnesium-supplemented animals had significantly smaller areas of atherosclerotic plaque than unsupplemented animals, because magnesium reduced blood cholesterol and triglyceride levels.8

These studies suggest that magnesium supplementation can help lower blood pressure and lipid levels. These effects are seen even more dramatically in lab experiments done on intact arterial segments in “organ bath” preparations, which isolate the part of the body being studied.

In these studies, when magnesium was added to the organ bath it triggered:

- **Dilation (relaxation) of coronary arteries** that had been damaged by insufficient oxygen. This damage to the arteries that supply blood to the heart is called hypoxia, and is often seen before a heart attack. Magnesium enhances the production of nitric oxide in the body, which naturally relaxes the arteries, increasing blood flow and reducing heart attack risk.14

- **Enhanced dilation of pulmonary arteries** (which carry blood from the heart to the lungs) damaged by hypoxia. Poor pulmonary artery relaxation is a factor in heart failure.15

- **Reduced accumulation of calcium** in segments of rat aortas, compared with segments not treated with magnesium.16 Calcification of major arteries is a significant contributor to arterial stiffness and reduced blood flow that leads to heart attacks and strokes.

**Results of Human Studies**

Human trials show that magnesium supplementation plays a part in prevention or mitigation of several dangerous cardiovascular disorders.

**Endothelial dysfunction** drives up blood pressure and precedes potentially fatal disorders like atherosclerosis, heart attack, stroke, and heart failure. **Diuretic drugs**, the first-line hypertension treatment, can trigger magnesium loss in urine, which aggravates the very problems they are meant to solve.17

Magnesium supplementation has been shown to help prevent these changes.

In a group of hypertensive women, ages 40-65, on diuretic therapy, oral magnesium-supplementation
HOW MAGNESIUM LOWERS CARDIOVASCULAR DISEASE RISK

(600 mg/day) reduced blood pressure, lowering systolic (top number) pressure to 134 from 144 mmHg, and diastolic (lower number) pressure to 81 from 88, after six months of therapy.17

This result was linked to increased blood vessel dilation and significant improvements in endothelial function in supplemented women.

In addition, the thickness of the carotid artery, a measure of unhealthy arterial thickening, rose in placebo patients during the six-month period, but was unchanged in supplemented subjects.

A 2018 meta-analysis found that magnesium supplementation improved endothelial function.18

**Coronary artery disease** occurs when the arteries to the heart muscle develop atherosclerotic plaques, reducing blood flow and raising the imminent risk of heart attack.

Magnesium supplementation improves both heart function and exercise tolerance in people with coronary artery disease. In a study of 53 men suffering from the ailment, 365 mg of oral magnesium citrate taken twice daily for six months resulted in improved oxygen utilization during exercise and greater pumping action of the left ventricle (main pumping chamber) in the heart. This indicates significant improvements in blood flow and oxygen delivery.19

**Heart failure** is defined as the inability of the heart muscle to pump sufficient blood to meet bodily needs. It often arises in people who’ve had a heart attack. It can eventually result in the failure of multiple organs and death.

In a study of 22 patients with symptomatic chronic heart failure, an 800 mg/day dose of magnesium for three months produced a significant increase in arterial compliance (a measure of how well an artery can relax and contract in response to blood flow).20

This indicates improved endothelial function and improved ability of the arteries to deliver oxygen-rich blood to target organs.

**MAGNESIUM SUPPLEMENTS VARY**

There is no single “optimal” form of magnesium for supplementation. Instead, it is important to consider the reason for the supplement.

One approach for ideal magnesium supplementation is to use a two-part supplement composed partly of magnesium citrate in a quick-release form and magnesium oxide in an extended-release form.

Magnesium oxide is highly concentrated, allowing a lot of magnesium to go into a relatively small pill. Because magnesium oxide is somewhat less bioavailable, it is ideal for an extended-release formulation, which gradually makes its way into the circulation.

Magnesium citrate, on the other hand, is less concentrated but is highly bioavailable, which allows for quick release of the mineral in a form that is readily absorbed.

This kind of innovative combination provides extended magnesium benefits in a single supplement.
Summary

Scientists have determined that having **low magnesium levels increases** the risk for conditions that are major risk factors for heart disease and strokes.

New evidence reveals that magnesium lowers cardiovascular risk through reductions in inflammation and improvements in endothelial function.

Magnesium boosts output of vessel-relaxing factors, including nitric oxide, and combats factors that narrow and harden arteries and restrict blood flow. Magnesium also fights the calcification that stiffens arteries.

Human studies demonstrate that regular magnesium supplementation has favorable effects on:

- Blood pressure,
- Coronary artery disease, and
- Heart failure.

Higher magnesium consumption, via diet or supplementation, has been demonstrated to provide numerous benefits, including lowering cardiovascular disease risk.

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

A Summary of Magnesium’s Effects on Cardiovascular Health

Cardiovascular disease and its risk factors are complex disorders, with many interwoven threads leading to potentially catastrophic outcomes.

Here’s a summary of what is known about magnesium’s effects on the heart and blood vessels.

Magnesium:3,21

- Naturally counteracts ill effects of calcium in arterial walls, preventing calcium deposition and maintaining vessel elasticity,
- Promotes production of signaling molecules that trigger vessel dilation (relaxation) to permit increased blood flow,
- Balances effects of acute and chronic stress by modulating the impact of stress-response signaling molecules,
- Regulates turnover of proteins in vessel walls that determine elasticity and flexibility, properties that are lost as atherosclerosis progresses,
- Modulates electrical signaling in the heart muscle to enhance its contractility (“squeeze”),
- Reduces risk factors for thrombosis (clotting inside arteries that blocks blood flow), and
- Regulates migration of cells in arterial walls that overgrow in atherosclerosis, thereby reducing arterial thickness and stiffening.

These properties help to explain why humans with low magnesium intake or blood levels have higher risks for atherosclerosis, coronary artery disease, arrhythmias, and heart failure.21
References

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LE: Let’s start with the basics. Why is protein so important?

Spano: Dietary protein helps build muscle and is needed for chemical reactions throughout the body. But our need for protein is really a need for amino acids, the building blocks that make up protein. The body breaks down proteins to get the amino acids.

LE: What happens if we don’t get enough protein?

Spano: When people consume a diet with insufficient protein, their bodies will break down skeletal muscle to help meet amino acid needs for critical processes. Over time, this can take a toll. Low protein intake is associated with reduced muscle mass and decreased strength throughout life.1,2

LE: How much protein do we need?

Spano: The Recommended Dietary Allowance (RDA) of protein for adults 19 and older is 0.8 grams per kilogram of body weight (0.8 g/kg). It is now generally recommended that older adults consume from 1.0 to 1.2 g/kg body weight of protein daily.3,4 This corresponds to 82.5-99 grams (just under three ounces to 3.5 ounces) of protein for an 82.5 kg (182 pound) person.
A standard four-ounce serving of salmon provides 26 grams of protein. However, there are some concerns that a higher protein intake may be harmful to those with kidney disease. People with depressed kidney function should consult with a physician before consuming supplements with protein and amino acids.

LE: Should people try to get that protein in one sitting?

Spano: Definitely not! Protein intake should be evenly spaced throughout the day, in three or more meals. There’s a limit to the amount of protein a person can use at one time to build skeletal muscle. When we eat more protein and amino acids than we can use, we don’t store them for later use. That is why we must consume protein in “doses” or regular meals throughout the day.

LE: What are the best protein sources?

Spano: High-quality proteins contain all essential amino acids, those the body cannot make and therefore must consume. All essential amino acids are needed for muscle protein synthesis. Fall short in one or more, and muscle protein synthesis will not be sustained at the same rate.

Most animal-based proteins contain all essential amino acids. Whey, seafood, and eggs are good examples. Many plant proteins lack one or more essential amino acids. But some plant proteins, including pea protein isolate and brown rice, stand out for their higher leucine content. And two or more plant proteins can be combined to make a protein-rich product with all essential amino acids. Plant protein can also be fortified with the missing essential amino acids to make it a truly complete protein source.

Spano: If you’re using an animal-based protein supplement such as whey or egg, look for one without a ton of other ingredients that you may not need. If you are lactose intolerant, choose whey protein isolate, which is 99% lactose free.
Ideally, plant proteins should be blended, including two or more types of proteins, or they should have the missing essential amino acids added.

**LE:** We often think of protein powder as something for bodybuilders. But does taking a protein supplement have benefits for all aging adults?

**Spano:** It might, if it helps that individual reach the correct amount of dietary protein intake. Muscle mass gradually decreases with age, a process called sarcopenia. Sarcopenia develops around the fourth or fifth decade of life, and can be worse due to chronic illness, inactivity, or inadequate protein and caloric intake. Once sarcopenia starts, a person loses 3% to 8% of muscle mass each decade while strength decreases by 3% per year after age 60. Simple tasks like opening a container of food or lifting groceries can become difficult, and the risk of dangerous falls increases.

A higher protein intake has been shown in multiple studies to slow the progression of sarcopenia, improving quality of life. Regular physical activity, including resistance exercise, is also vital for slowing muscle loss. Protein powders make it easy to get more protein in the diet.

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Marie A. Spano, MS, RD, CSCS, CSSD, is a nutrition communications expert and one of the country’s leading sports nutritionists for professional teams.

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

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**References**


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<td>• Vanilla or chocolate flavor</td>
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<td>• Provides 3 grams of L-glutamine to promote exercise recovery</td>
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<td>Item # 02242 • Whey Protein Isolate (Vanilla) • 403 grams (14.22 oz.)</td>
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Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again

BY DR. ERIC TOPOL

Along with the explosive economic growth of healthcare, the practice of medicine has been progressively dehumanized.

The healthcare system is in crisis. Doctors are overworked and burned out, and the lack of time for individualized attention with patients has led to record numbers of misdiagnoses and medical errors.

In his latest book, Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again, Dr. Eric Topol, world-renowned cardiologist and executive vice president of Scripps Research, discusses a surprising solution: artificial intelligence (AI).

While integrating computers into the healthcare system might initially seem less human, Topol explains that the true benefit of AI is its potential to help free doctors from tasks that interfere with human connection. According to Topol, technology like virtual assistants, smart speakers, and smartphone apps will liberate doctors from keyboards, freeing them to spend the time necessary to restore trust between doctor and patient.

In addition, Topol discusses how AI can help improve aspects of the healthcare system ranging from diagnosing cancer, to helping predict and prevent suicide, to helping seniors live independently. Along the way, he is open about the potential pitfalls of the technology (including privacy and ethics), noting where AI has fallen short and envisioning how it could improve in the future.

In this Q&A with Life Extension®, adapted from Deep Medicine, Dr. Topol explains in more detail the exciting technological advances that are ushering in a new, improved age of medicine and healthcare.

—Laurie Mathena
**LE:** Artificial intelligence (AI) seems like science fiction, but it is very much a reality today.

**Dr. Topol:** AI has been sneaking into our lives. It is already pervasive in our daily experiences, ranging from autocomplete when we type, to unsolicited recommendations on Google searches, to music suggestions based on our listening history, to Alexa answering questions or turning out the lights.

Conceptually, its roots date back more than 80 years, and its name was coined in the 1950s, but only recently has its potential impact in healthcare garnered notice. The promise of artificial intelligence in medicine is to provide composite, panoramic views of individuals' medical data; to improve decision making; to avoid errors such as misdiagnosis and unnecessary procedures; to help in ordering and interpretation of appropriate tests; and to recommend treatment. Underlying all of this are data.

While the data keep pouring out, we’ve processed only a tiny fraction. Most estimates are less than 5%, if that much. In a sense, it was all dressed up with nowhere to go—until now. Advances in artificial intelligence are taming the unbridled amalgamation of Big Data by putting it to work.

**LE:** In your book, you discuss deep learning, which teaches computers to do what comes naturally to humans. Can you give an overview of what deep learning can accomplish?

**Dr. Topol:** In the past few years, several studies relying on deep learning have been published in leading peer-reviewed medical journals.

Many in the medical community were frankly surprised by what deep learning could accomplish: studies that claim AI’s ability to diagnose some types of skin cancer as well as or perhaps even better than board-certified dermatologists; to identify specific heart-rhythm abnormalities like cardiologists; to interpret medical scans or pathology slides as well as senior, highly qualified radiologists and pathologists, respectively; to diagnose various eye diseases as well as ophthalmologists; and to predict suicide better than mental health professionals.

These skills predominantly involve pattern recognition, with machines learning those patterns after training on hundreds of thousands, and soon enough millions, of examples. Such systems have just gotten better and better, with the error rates for learning from text-, speech-, and image-based data dropping well below 5%, whizzing past the human threshold.

**LE:** Let’s talk in more detail about a few specific examples. How could AI transform the field of, say, radiology?

**Dr. Topol:** A radiologist reads about 20,000 studies a year, which equates to somewhere between 50-100 per day, a number that has been steadily increasing. While X-rays are single-digit images per exam, ultrasounds are dozens, and CT scans and MRIs are hundreds, a ratio that keeps increasing. All told there are more than 800 million medical scans a year in the United States, which amounts to about 60 billion images, or one image generated every two seconds.

Some studies suggest that errors in interpretation of medical scans are far worse than generally accepted, with false positive rates of 2% and false negative rates over 25%. Given those 800 million annual scans, that means large numbers of readings are at risk of being wrong.

Radiologists, then, would certainly benefit from a machine accuracy booster. For example, a careful study of classifying more than 50,000 chest X-rays as simply either
LE: How can AI help with something like a cancer diagnosis?

**Dr. Topol:** There is one last place so far where cancer could prove amenable to attack by AI: gastroenterology. The accurate diagnosis of colon polyps and cancer lesions during colonoscopy is more difficult than most people are aware. Multiple studies have shown that these lesions are missed in at least 20% of patients, with some reports considerably higher.

Recently, the idea of using AI to detect these lesions was advanced in a deep-learning study that used 300 features from 30,000 colonoscopy images, magnified 500-fold, and then tested the algorithm in 250 patients with 306 polyps. The 86% accuracy achieved is promising compared with the literature.

In the first prospective study of colonoscopy with real time AI-processed imaging, the results from 325 patients were very encouraging for accurate diagnosis of tiny (as they are called “diminutive”) polyps. The use of such high magnification and machine pattern review suggests it may ultimately be a very useful adjunct for this important screening procedure.

LE: Does AI have the capability of helping someone develop a personalized nutrition plan?

**Dr. Topol:** AI can also revolutionize other aspects of our lives that are, in one sense or another, upstream from the clinic. A huge one is how we eat.

One of the unexpected and practical accomplishments of machine learning to date has been to provide a potential scientific basis for individualized diets. That’s conceivably an exciting advance—the idea of knowing what specific foods are best for any given person.

We can now predict in healthy people, without diabetes, what particular foods will spike their blood sugar. Such advances far outstrip whatever benefits might accrue from following a diet for all people, such as the classic food pyramids, or fad diets like Atkins or South Beach, none of which ever had a solid evidence basis.
Many of these at-home advances will come together in the virtual medical coach. It most likely will be voice mediated, like Siri, Alexa, and Google Home, but unlikely to remain a cylinder or a squiggle on a screen. I suspect they’re more apt to come in the form of a virtual human avatar or hologram (but simply text or e-mail if one prefers).

The virtual medical coach is the deep learning of all of one’s data, seamlessly collected, continuously updated, integrated with all biomedical knowledge, and providing feedback and coaching. Such systems will initially be condition-specific, say for diabetes or high blood pressure, but eventually they’ll offer a broad consumer health platform to help prevent or better manage diseases.

**LE:** One of the ironies of AI is that you claim this technology will make healthcare human again.

**Dr. Topol:** Along with the explosive economic growth of healthcare, the practice of medicine has been progressively dehumanized. Rather than all the talk of “personalized” medicine, business interests have overtaken medical care. Clinicians are squeezed for maximal productivity and profits. We spend less and less time with patients, and that time is compromised without human-to-human bonding.

The medical profession has long been mired in inefficiency, errors, waste, and suboptimal outcomes. In recent decades, it has lost its way from taking true care of patients. A new patient appointment averages 12 minutes, a return visit, seven.

One of the most important potential outgrowths of AI in medicine is the gift of time. Time is essential to the quality of care patients receive and to their health outcomes.

AI can help achieve the gift of time with patients. One of the most important effects will come from unshackling clinicians from electronic health records. At the University of Colorado, taking the computer out of the exam room and supporting doctors with human medical assistants led to a striking reduction in physical burnout, from 53% to 13%.

We need everyone on board, not just leaders. If the heightened efficiency is just used by administrators as a means to rev up productivity, so doctors see more patients, read more scans or slides, and maximize throughput, there will be no gift of time.

**LE:** Can you give a few specific examples of how AI could help free up time for doctors and nurses?

**Dr. Topol:** How AI can ease medical workflow is exemplified by a program that MedStar Health, the largest health system in the Washington, DC, region, has initiated in its emergency rooms. The typical ER patient has about 60 documents in his or her medical history, which takes considerable time for clinicians to review and ingest.

MedStar developed a machine-learning system that rapidly scans the complete patient record and provides recommendations regarding the patient’s presenting symptoms, freeing doctors and nurses to render care for their patients.

Another example is AI automation of medical images, which isn’t simply about reading MRIs. The FDA-approved Arterys algorithm called Deep Ventricle enables rapid analysis of the heart’s blood flow, reducing a task that can take an hour as blood is drawn and measured by hand, to a 15-second scan.

**LE:** The potential of AI to improve so many aspects of healthcare is very exciting.

**Dr. Topol:** We’re still in the earliest days of AI in medicine. The field is long on computer algorithmic validation and promises but very short on real-world, clinical proof of effectiveness.

But with the pace we’ve seen in just the past few years, with machines outperforming humans on specific, narrow tasks and likely to accelerate and broaden, it is inevitable that narrow AI will take hold.

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Eric Topol is a world-renowned cardiologist, executive vice president of Scripps Research, founder of a new medical school, and one of the top 10 most-cited medical researchers.

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Cucumbers

BY LAURIE MATHENA

With a water content of 96%, cucumbers are a low-calorie, nutrient-packed health food.

They originated in Ancient India around 2,000 BC, and were brought to the “New World” by Christopher Columbus in 1494. Now, they are enjoyed both raw and fermented all over the world.

As part of a healthy diet, cucumbers may provide a variety of health benefits, including helping maintain healthy blood sugar levels and rejuvenating the skin.

**Raw Cucumbers**

Because cucumbers are high in water content and low in calories, they are an ideal food for weight loss. A meta-analysis showed that eating these kinds of “low energy” foods could help obese individuals lose weight.1 And because of their high water and fiber content, cucumbers can also help prevent constipation and maintain regularity.2

In addition, two animal studies demonstrated that consuming cucumbers and other plants may help support healthy blood sugar levels.3,4

**Skin Health**

Cucumbers have a long history of use for treating dark circles and puffiness under the eyes. They contain *caffeic acid*, which is regarded as a promising substance for dermal use because of its anti-inflammatory, antimicrobial, and collagen-production stimulating activity.5

Fresh cucumber juice has been used to nourish the skin, and it gives a soothing effect against skin irritations and reduces swelling.6 Cucumbers have also been shown to help restore the skin’s natural elasticity, making it valuable for helping prevent wrinkles.7

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02169 Rainforest Blend Ground Coffee
02171 Rainforest Blend Whole Bean Coffee
00438 Stevia™ Organic Liquid Sweetner
00432 Stevia™ Sweetener

GLUCOSE MANAGEMENT
01503 CinSulin® with InSea² and Crominex® 3+
01620 CoffeeGenic® Green Coffee Extract
01700 Cardio Peak™ with Standardized Hawthorn and Arjuna
02122 Glycemic Guard™
01525 Mega Benfotiamine
01803 Tri Sugar Shield®

HEART HEALTH
01066 Aspirin (Enteric Coated)
01842 BioActive Folate & Vitamin B12 Caps
01700 Cardio Peak™ with Standardized Hawthorn and Arjuna
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, 30 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 (Dehydroepiandrosterone)
15 mg, 100 capsules
00335 DHEA (Dehydroepiandrosterone)
25 mg, 100 capsules
00882 DHEA (Dehydroepiandrosterone)
50 mg, 60 capsules
00607 DHEA (Dehydroepiandrosterone)
25 mg, 100 tablets (dissolve in mouth)
01689 DHEA (Dehydroepiandrosterone)
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 with Resveratrol
01929 Super Ubiquinol CoQ10

IMMUNE SUPPORT
00681 AHCC®
02302 Bio-Quercetin
01961 Enhanced Zinc Lozenges
01704 Immune Modulator with Tinofend®
00955 Immune Protect with PARACTIN®
02005 Immune Senescence Protection Formula™
29727 Kinoko® Gold AHCC
24404 Kinoko® Platinum AHCC
00316 Kyolic® Garlic Formula 102
00789 Kyolic® Reserve
01681 Lactoferin (Apolactoferin) Caps
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™ Turmeric Extract
00202 Boswellia
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 Serraflazyme
01203 Specially-Coated Bromelain
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
00522 Glucosamine/Chondroitin Capsules
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
02240 Anti-Alcohol HepatoProtection Complex
01651 Calcium D-Glucarate
00550 Chlorella
01571 Chlorophyllin
01922 European Milk Thistle • 60 softgels
01925 European Milk Thistle • 120 softgels
01522 European Milk Thistle • 60 veg capsules
01541 Glutathione, Cysteine & C
01393 HepatoPro
01608 Liver Efficiency Formula
01534 N-Acetyl-L-Cysteine
PRODUCTS

LONGEVITY & WELLNESS
00342 PectaSol-C® Modified Citrus Pectin Powder
01080 PectaSol-C® Modified Citrus Pectin Capsules
01884 Silymarin

MEN'S HEALTH
02209 Male Vascular Sexual Support
00455 Mega Lycopene Extract
02306 Men's Bladder Control
01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula
01837 Pomi-T®
01373 Prelox® Enhanced Sex for Men
01940 Super R-Lipoic Acid
01909 Triple Strength ProstaPollen™
02099 Ultra Prostate Formula

MINERALS
01661 Boron
02107 Extend-Release Magnesium
30731 Ionic Selenium
01677 Iron Protein Plus
01459 Magnesium Caps
01682 Magnesium (Citrate)
01328 Only Trace Minerals
01504 Optimized Chromium with Maritech® 926
01837 Pycnogenol® French Maritime Pine Bark Extract
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 (5-Adenosyl-Methionine) 200 mg, 30 enteric coated tablets
02176 SAMe (5-Adenosyl-Methionine) 400 mg, 30 enteric coated tablets
02174 SAMe (5-Adenosyl-Methionine) 400 mg, 60 enteric coated tablets

MULTIVITAMINS
02199 Children's Formula Life Extension Mix™
02398 Comprehensive Nutrient Packs ADVANCED
02354 Life Extension Mix™ Capsules
02364 Life Extension Mix™ Capsules without Copper
02356 Life Extension Mix™ Powder
02355 Life Extension Mix™ Tablets
02357 Life Extension Mix™ Tablets with Extra Niacin
02365 Life Extension Mix™ Tablets without Copper
02292 Once-Daily Health Booster • 30 softgels
02291 Once-Daily Health Booster • 60 softgels
02313 One-Per-Day Tablets
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 PEA Discomfort Relief

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

PET CARE
01932 Cat Mix
01931 Dog Mix

PROBIOTICS
01622 Bifido GI Balance
01825 FLORASSIST® GI with Phage Technology
01821 FLORASSIST® Heart Health
02250 FLORASSIST® Mood Improve
02208 FLORASSIST® Nasal
01210 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
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
80133 Anti-Oxidant Facial Mist Hydrator
80156 Collagen Boosting Peptide Serum

00342 PectaSol-C® Modified Citrus Pectin Powder
01080 PectaSol-C® Modified Citrus Pectin Capsules
01884 Silymarin
PRODUCTS

VITAMINS

01533  Ascorbyl Palmitate
00920  Benfotiamine with Thiamine
00664  Beta-Carotene
01945  BioActive Complete B-Complex
00102  Biotin
00084  Buffered Vitamin C Powder
02229  Fast-C® and Bio-Quercetin Phytosome
02075  Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
02070  Gamma E Mixed Tocopherol/Tocotrienols
01913  High Potency Optimized Folate
01674  Inositol Caps Liquid Emulsified
02244  Liquid Vitamin D3 • 2,000 IU, 1 fl oz
02232  Liquid Vitamin D3 • 2,000 IU, 1 fl oz, mint
01936  Low-Dose Vitamin K2
01536  Methylcobalamin • 1 mg, 60 veg lozenges
01537  Methylcobalamin • 3 mg, 60 veg lozenges
00065  MK-7
00373  No Flush Niacin
01939  Optimized Folate (L-Methylfolate)
01217  Pyridoxal 5'-Phosphate Caps
01400  Super Absorbable Tocotrienols
02334  Super K
02335  Super K Elite
01863  Super Vitamin E
02028  Vitamin B5 (Pantothenic Acid)
01535  Vitamin B6
00361  Vitamin B12
02228  Vitamin C and Bio-Quercetin Phytosome
1,000 mg, 60 veg tablets
02227  Vitamin C and Bio-Quercetin Phytosome
1,000 mg, 250 veg tablets
01753  Vitamin D3 • 1,000 IU, 90 softgels
01751  Vitamin D3 • 1,000 IU, 250 softgels
01718  Vitamin D3 • 7,000 IU, 60 softgels
01758  Vitamin D3 with Sea-Iodine™
02040  Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

00658  7-Keto® DHEA Metabolite • 25 mg, 100 capsules
02479  7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
01509  Advanced Anti-Adipocyte Formula
01807  Advanced Appetite Suppress
02207  AMPK Metabolic Activator
01823  CalReduce Selective Fat Binder
02478  DHEA Complete
01738  Garcinia HCA
29754  HCAActive Garcinia Cambogia Extract
01292  Integra-Lean®
01908  Mediterranean Trim with Sinetrol™-XPur
01492  Optimized Irvingia with Phase 3™ Calorie Control Complex
01432  Optimized Saffron with Satiereal®
00818  Super CLA Blend with Sesame Lignans
01902  Waist-Line Control™
02151  Wellness Code® Appetite Control

WOMEN'S HEALTH

01942  Breast Health Formula
01626  Enhanced Sex for Women 50+
01894  Estrogen for Women
01064  Femmenessence MacaPause®
02204  Menopause 731™
02319  Prenatal Advantage
01441  Progesta-Care®
01649  Super-Absorbable Soy Isoflavones
Everyday factors can lead to dry, itchy, irritated eyes.

**Tear Support with MaquiBright**® is a unique oral supplement that supports your body’s own tear production for continuous, all-day comfort.

The secret is the maqui berry’s rich source of delphinidins, a source of support for tear-producing glands. When human subjects took just 60 mg a day of **Maqui berry extract**, there was a 45% increase in lubricating tear production.

**Promote Tear Production From The Inside Out**

MaquiBright® is a registered trademark of MAQUI NEW LIFE S.A, Chile and ORYZA OIL & FAT CHEMICAL CO., LTD., Japan.

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

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For the past three years, Reader’s Digest’s Nicest Places in America contest has been celebrating acts of kindness and honoring communities where neighbors are helping one another and inspiring those around them to give back.

For the first time ever, we’ve partnered with Life Extension to shine the spotlight on Community Health Heroes who are committed to supporting and encouraging communities to live happier, healthier lives.

Discover their stories at rd.com/CommunityHealthHeroes
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The proper balance of microflora in the intestines is crucial for health and well-being. Jarrow Formulas® probiotic dietary supplements are designed to maintain a healthy balance of these microflora to maximize your digestive and immune system.*

Jarrow Formulas® is a probiotic pioneer and has a complete line of probiotic products, including Jarro-Dophilus EPS®.

For full product description or to order Jarro-Dophilus EPS call 1-800-544-4440 or visit www.LifeExtension.com

Jarro-Dophilus EPS® 5 Billion Per Capsule 60 Veggie Caps
Item # 00056 $17.96

Jarro-Dophilus EPS® 5 Billion Per Capsule 120 Veggie Caps
Item # 21201 $31.46

www.Jarrow.com

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Ultra Prostate Formula can help:
• Support healthy urination
• Promote healthy prostate size and function
• Encourage healthy inflammatory response
• Help inhibit PSA activity

“Thanks,
Ultra Prostate Formula.”

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

NON-STOP

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.
Normal *aging* results in a *decline* in a cell *enzyme* called *AMPK*.

As *AMPK* levels drop, a cell protein called *mTOR* increases.

Excess *mTOR* is associated with undesirable effects related to normal *aging*.

When *mTOR* is elevated, *weight loss* may be more difficult.

When cellular *AMPK* is *increased*, excess *mTOR* *decreases*.

**AMPK Metabolic Activator** is a dual-nutrient formula to support healthy *AMPK* activation.

For full product description and to order **AMPK Metabolic Activator**, call **1-800-544-4440** or visit **www.LifeExtension.com**
9 UNHEALTHY “GUMMY” VITAMINS
Commercial “gummy” supplements provide trivial nutrient potencies and as much as 4,000 mg of sugar per serving! Sugar-laden “gummies” used as dietary supplements may be harmful.

24 PROBIOTIC PROTECTION AGAINST FLU AND COLD VIRUSES
A blend of probiotics and a prebiotic reduced the number of flu and flu-like respiratory illnesses by 75% and colds by 39% in adults.

33 COFFEE REDUCES DNA DAMAGE
A recent study suggests that coffee reduces DNA damage by 23% in people.

40 SHIELD EYES FROM TOXIC BLUE LIGHT
Natural carotenoids filter out blue light from computer and smart phone screens to ease eye strain and reduce retinal damage.

50 HOW SAGE PROTECTS BRAIN FUNCTION
A sage extract has been clinically shown to increase memory performance in older adults by 60% along with enhanced attention.

60 MAGNESIUM AND CARDIOVASCULAR RISK
Boosting magnesium levels can lower blood pressure, promote arterial relaxation, fight arterial calcification, and improve endothelial function.