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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.
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Reference

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

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

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

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

Michael D. Ozner, MD, FACC, FAHA, is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of Heart Attacks Are Not Worth Dying For, The Great American Heart Hoax, and The Complete Mediterranean Diet. For more information visit www.DrOzner.com.

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

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Item #01713
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Tragic Errors!

About **34,700** men in the U.S. perished from **metastatic prostate cancer** in 2022.\(^1\)

Many of the deaths can be attributed to the **U.S. Preventive Services Task Force** recommending **against PSA screening** in 2008 and 2012.\(^2\)

As we long ago predicted, the penalty for avoiding **PSA screening** is an upsurge in **metastatic** prostate cancers.\(^3\)

A landmark study published by the **American Medical Association** confirms the absurdity of advising men to **not undergo PSA screening**.

From 2004 through 2010, there were **no statistically significant changes** in the incidence rate of **metastatic** prostate cancer. Back then **lots** of men were having **PSA blood tests** to detect **early-stage** disease.\(^2\)

Between **2010** and **2018** (after PSA screening declined) there was an approximate **41% increase** in **metastatic prostate cancer** incidence.\(^2\)

This study also found **higher PSA levels** at diagnosis, suggesting a higher risk of more advanced disease occurring **after** the **U.S. Preventive Services Task Force** advised **against PSA screening**.

The authors of this **American Medical Association**-published study predict that these data may translate into even **higher** future incidences of **metastatic disease** and **deaths** caused by delayed diagnoses.

This **tragic error** is an example of government-funded “committees” making sweeping policy recommendations that do not apply to most readers of **Life Extension** Magazine.

**Prostate cancer** is the second leading cause of cancer death in men.\(^1\)

A low-cost **blood test** called PSA (prostate-specific antigen) is a screening tool to monitor prostate health.

This test can indicate when further diagnostics are necessary or prompt a man to initiate lifestyle changes that can **reduce** PSA levels.

Early detection is critical, because it helps to identify cancer in time for curative treatment to be initiated.\(^4\)

What’s interesting is how quickly **PSA screening declined** after misguided policy statements were issued by the **U.S. Preventive Services Task Force**.
Consequences of Reduced PSA Screening

The initial effect of the United States Preventive Services Task Force recommendations in 2008–2012 was a decline in prostate cancer diagnoses. This happened because as the number of PSA tests went down, so did new cases... at least in the beginning.

By the year 2016, however, 11,387 more American men were diagnosed with metastatic prostate cancer compared to 2008 levels, when PSA blood test prevalence was robust.10

In 2022, the American Medical Association published a huge study that found by 2018, about 12,300 more men were being diagnosed with metastatic prostate cancer each year... 41% of whom were aged 45-75 and 43% were above 75 years.2

Interestingly, in a multicenter randomized European trial, that did not follow the United States Preventive Services Task Force (USPSTF) recommendations for PSA screening, participants were followed up for 13 years. It was found that there was a 21% reduction in the risk of prostate cancer and a 27% reduction in the risk of prostate cancer mortality in PSA-screened men.11

Fewer PSA Screenings = More Metastatic Disease

In men 45 to 74 years old, there was a nonsignificant decline in the incidence rate of metastatic prostate cancer from 2004 to 2010 followed by an approximately 41% increase from 2010 to 2018. For men aged 75 years and older, there was a significant decline in incidence of metastatic prostate cancer from 2004 through 2011 followed by an even steeper 43% increase.2

Government-Funded Committees

The United States Preventive Services Task Force is a group funded by the federal government and private industry.5

In 2008, the United States Preventive Services Task Force recommended that men over age 75 not have their blood routinely screened for PSA.6

In 2012, the United States Preventive Services Task Force recommended against routine PSA screening for all men.7

These recommendations resulted in the media proclaiming that PSA screening should be halted.

My response was to write an article titled “Federal Death Panels,” published in the May 2013 issue of Life Extension® Magazine.
Few metastatic prostate cancer patients will be cured. Some are kept alive by grueling chemotherapy, radiation, and hormone-ablation regimens.

The needless suffering and deaths caused by this tragic error will likely go into the history books as an example of misinterpreting the use and value of a simple screening tool (PSA blood test) to detect and manage early-stage disease.

Controlling PSA Levels

Detecting a rising PSA in early stages enables dietary, lifestyle, and other changes that can lower future PSA readings.

PSA is more than a marker for prostate disease. Prostate cancer cells secrete abundant PSA that degrades healthy prostate tissues to make room for tumor expansion.

We’ve published articles over the decades about how switching to a Mediterranean diet with emphasis on cutting back on red meat and dairy can reverse a rising PSA blood level.

Low-Cost Blood Tests

Record numbers of American men are battling metastatic prostate cancer, yet PSA screening is still underutilized.

Life Extension long ago advocated that men over age 40 have an annual PSA test, along with measures of cardiovascular risk that can be neutralized if caught in early stages.

A PSA blood test costs $31.

A CBC/Chem/Lipids Panel that provides a broad spectrum of health indicators costs $35.

If you order by September 25, 2023, the price for the CBC/Chem/Lipids Panel + PSA blood tests is only $45 (Item # LC100081).

To order these discounted blood tests, call 1-800-208-3444 (24 hours/day) or visit: www.LifeExtension.com/PSA

For longer life,

William Faloon, Co-Founder
Life Extension®
History of PSA Testing

PSA was first identified in blood in 1979. Doctors began using PSA as a diagnostic tool when treating prostate cancer patients in 1987. The FDA approved PSA testing for this purpose in 1994.

As advocacy groups like Life Extension urged men to utilize PSA as a screening tool, tens of millions of American men began adding PSA to their annual list of blood tests.

The number of lives spared by early detection remains a hotly debated topic. One reason for the controversy is that typical aging men develop multiple chronic conditions that often kill before clinically relevant prostate cancer develops.

The unhealthy status of average older men does not apply to those who take proactive steps to safeguard their health, as increasing numbers of informed consumers are doing.

Of interest, late in 2017, health authorities in Mexico published a legally binding national prostate cancer screening guideline stating that all Mexican men over age 45 should be screened using digital rectal examination and PSA. Men with a family history of prostate cancer should begin at age 40.

In this instance, Mexico appears to be ahead of U.S. health officials in taking proactive steps to reduce the prostate cancer mortality of its citizens.

Before PSA testing was “approved” by the FDA, enlightened Americans would travel to Mexico or other countries to have a PSA blood test performed. It was considered controversial in those early days.

References

LOW-COST Blood Testing

Blood tests can detect underlying health issues before serious illness manifests.

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  - RDW (red blood cell distribution)
  - White blood cell count • Immune Cell Differentiation Count • Platelet count

- **PSA (prostate-specific antigen)**

- **Liver Function:**
  - Alkaline phosphatase
  - LDH (lactate dehydrogenase)
  - AST (aspartate aminotransferase)
  - ALT (alanine transaminase)
  - Total protein • Albumin • Globulin
  - Albumin/globulin ratio
  - Bilirubin

- **Lipid Profile:**
  - Total cholesterol • Triglycerides
  - HDL cholesterol • LDL cholesterol (calc.)
  - VLDL cholesterol (calc.)
  - Total cholesterol/HDL ratio
  - Estimated Coronary Heart Disease risk

- **Blood Sugar:**
  - Fasting glucose

- **Kidney Function:**
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  - eGFR (estimated glomerular filtration rate)

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These tests cost far less than what commercial labs charge and you get results back fast.

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- Joint discomfort
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Who We Are
Life Extension Clinical Research, Inc. is a dedicated research arm of Life Extension. We research innovative dietary supplements and anti-aging regimens for their potential to influence everything from medical treatments to nutritional protocols, disease prevention, diagnostic processes and even genetic studies.

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Men’s Bladder Clinical Study: This study showed promise for men seeking non-pharmaceutical therapies for frequent, sleep-disrupting nighttime urination.

Life Extension
Life Extension Clinical Research, Inc.

For more Information, contact us at LifeExtension.com/CL114 or call us at 1-866-517-4536
Multivitamins Help Maintain Memory in Aging Individuals

Results from two clinical trials indicate that daily multivitamin supplementation can help prevent memory loss and slow cognitive decline among older individuals, the American Journal of Clinical Nutrition reported.*

The COcoa Supplement and Multivitamin Outcomes Study (COSMOS), including (COSMOS-Web and COSMOS-Mind) evaluated the effects of multivitamin supplementation on cognitive function.

COSMOS-Mind found that compared to a placebo, supplementing with a daily multivitamin-mineral was associated with better scores for cognition and executive function, and less cognitive decline.

COSMOS-Web included 3,562 men and women who received a multivitamin supplement or a placebo daily for three years. Cognitive assessments were conducted at enrollment and yearly for the remainder of the trial. After one year, as well as on average during the three years of follow-up, participants who received multivitamins had better immediate recall compared with the placebo group.

Editor's Note: The researchers estimated that, “... the effect of the multivitamin intervention improved memory performance above placebo by the equivalent of 3.1 years of age-related memory change.”

Lower Folate-B12, Higher Homocysteine, and H. Pylori Linked with Erectile Dysfunction

A recent clinical study found that *H. pylori* infection may lead to decreased absorption of vitamin B12 and folic acid. This led to increased homocysteine levels, which might be associated with erectile dysfunction (ED) in men.*

Among other factors involved in erectile function, *higher* levels of serum homocysteine is associated with poor endothelial functioning which accelerates *atherosclerosis*.

In this observational study, researchers investigated the relationship between homocysteine, folic acid, and vitamin B12.

It was found that *H. pylori* antibodies were *higher* in men with ED as compared to healthy men.

The ED group also had significantly *higher* levels of homocysteine and *lower* levels of B vitamins as compared to healthy men.

**Editor’s Note:** Researchers concluded that *H. pylori* infection eradication or folic acid and B12 supplementation might have certain clinical value in the treatment of vascular ED.

* Sex Med. 2023 Mar 1;11(2):qfac018.
Fish Oil Improves Body Composition, Strength, Performance in Older Individuals

A secondary analysis of findings from a clinical trial found improvements in body composition, muscle strength and physical performance among older men and women who consumed a supplement containing fish oil compared to a placebo.*

The six-month trial included 200 people aged 60 and older. Participants were randomized to receive a fish oil supplement that provided 1,340 mg of EPA and 1,007 mg of DHA or a placebo.

After six months, there was a significant increase in thigh circumference among those who received fish oil, while waist and hip circumference remained relatively the same.

Total skeletal muscle mass, appendicular skeletal muscle mass, muscle strength (as evaluated by hand-grip strength measurement) and physical performance (demonstrated by the ability to rise from a chair and walk) also improved among fish oil-supplemented participants compared with the placebo group.

Editor's Note: The supplemented group additionally experienced a decrease in serum triglycerides and an increase in HDL cholesterol.

* Age Ageing. 2022 Dec 5;51(12):afac274.
Lower Vitamin C Levels Linked to Greater Health Risk for Diabetics

Low serum levels of vitamin C may put adults with pre-diabetes or diabetes at greater risk, a study showed.*

The study analyzed data from 52,150 individuals who participated in NHANES from 1999–2018. Among the participants 6,827 had type II diabetes and 428 had type I diabetes. Data included fasting plasma glucose and A1c levels.

Those whose intake of vitamin C was lower than the estimated average requirement had a 20% higher risk of type II diabetes compared with an intake above the estimated average requirement.

Those who did not use vitamin C supplements had a 28% greater risk than supplement users.

Low and deficient serum vitamin C levels were associated with fewer years of life in comparison with normal levels.

Editor’s Note: Not supplementing with vitamin C was associated with a 25% greater mortality risk among people with type I diabetes, a 20% greater risk among those with type II diabetes, and a 24% greater risk among those without diabetes compared with those who supplemented.

* Nutrients. 2022 Sep 21;14(19):3902.
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Ultra Prostate Formula was created to help maintain prostate health. It contains a dozen ingredients to:

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A special form of MAGNESIUM has been shown to target stress where it starts—in the brain.

Magnesium assists in the maintenance of healthy cortisol levels and production of serotonin.¹

Calm-Mag contains magnesium acetyl-taurinate which has been shown in preclinical studies to increase brain tissue magnesium levels.

In a clinical study of women with a magnesium poor diet,² this form of magnesium:

- Promoted a calm, relaxed state of mind
- Contributed to healthy mood

Calm-Mag provides 50 mg of elemental magnesium in each daily capsule. It may be used with other forms of magnesium.

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Homocysteine Resist supports healthy levels of homocysteine, an unfavorable amino acid that can increase with normal aging.

Just one daily capsule of HOMOCYSTEINE RESIST provides:

<table>
<thead>
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<tr>
<td>5-MTHF (activated folate)</td>
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<td>Methylcobalamin (activated vitamin B12)</td>
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*DEF (Dietary Folate Equivalents)
OMEGA-3S and Macular Degeneration Risk
Age-related **macular degeneration** is a *leading cause* of permanent **vision loss** in the elderly.¹

The risk of developing it, however, can be markedly *lowered*.

Two large meta-analyses of **human** studies found that a *higher* intake of **omega-3 fatty acids** from fish oil is associated with a reduced risk of the development and progression of **macular degeneration**.²,³

In one, patients with the *highest* levels of total dietary **omega-3** intake had a 49% *reduction in risk* of age-related **macular degeneration**.³
The Two Types of Macular Degeneration

Age-related macular degeneration can be divided into two types:¹

- **Dry** macular degeneration results when the cells of the macula grow thin and break down.
- **Wet** macular degeneration occurs when abnormal blood vessels beneath the retina grow and leak, damaging the macula.

The **wet form** tends to be much more severe and progressive. It is responsible for most of the cases that lead to blindness.

How Fish Oil Protects Vision

Age-related macular degeneration is a disease of the retina, the layer of nerve cells at the back of the eye that detects light and sends signals to the brain to enable vision.

The **macula** is the part of the retina responsible for sharp, straight-ahead vision.

When these cells are damaged or lost, **visual acuity** (sharpness) declines. Basic tasks like driving and reading become impossible, and **blindness** can eventually result.¹

Oxidative stress and inflammation drive the progression of macular degeneration.⁵

**Omega-3 fatty acids** from fish oil may protect eye health in a few ways.

For one, **omega-3s** are structural components of **cell membranes** in the maculae.⁶ They have **anti-inflammatory,**⁶ **neuroprotective,**⁷,⁸ and other effects that mitigate the processes that lead to macular degeneration.⁹-¹¹

The **retina** of the eye is an extension of the **optic nerve,** which extends directly from the brain.¹² Omega-3s help shield the retina from age-related degenerative changes that damage these cells.¹¹,¹³,¹⁴

Omega-3s and Macular Degeneration Risk

Several epidemiological studies have found that people with the **highest** intake of **omega-3 fatty acids** had the **lowest** risk of developing macular degeneration.¹⁰,¹⁵-²⁰ Observational studies have shown that increased dietary intake of omega-3 slows the progression of the disease.²¹

In 2021 and 2022, the results of two large meta-analyses investigating this topic were published.²,³

The first examined data from 21 separate human studies around the world from more than 190,000 individuals. It looked at whether intake of fish oil-derived **omega-3 fatty acids** was predictive of **age-related macular degeneration.²**

The results showed that those with the **highest** intake of fish oils had a **14% lower risk** of **early-stage** age-related macular degeneration and a **29% lower risk** of **late stage** (more severe) macular degeneration.²

Further analysis found that for each additional 1,000 mg of **omega-3** intake per day, the risk for early macular degeneration was lowered by 6%, and the risk for late macular degeneration was reduced by 22%.²

The researchers also explored whether there was any difference between the two primary fatty acids found in fish oils, **DHA** and **EPA**. They found that **both** DHA and EPA, when analyzed alone, were protective in individuals with the highest intake.²
Omega-3s and ‘Wet’ AMD

The other meta-analysis, published in 2022, specifically evaluated patients with wet age-related macular degeneration. It included data from five studies performed in Japan, the United States, and Europe, in over 12,000 patients.

Even for this more aggressive type of macular degeneration, the analysis found that intake of fish oil-derived omega-3 fatty acids was significantly associated with a reduced risk.

Patients with the highest levels of total dietary omega-3 intake had a remarkable 49% reduction in risk for wet macular degeneration, compared to those with the lowest intake.

Studies in the meta-analysis reported a significant correlation between total intake of omega-3 fatty acids and risk for this blinding form of macular degeneration.
This study also separated DHA and EPA to see if they differed in their protective ability. Both were found to be protective, with the highest consumption of DHA predicting a 39% lower risk of wet macular degeneration and the highest consumption of EPA predicting a 32% lower risk.3

These analyses provide evidence that fish oil can help protect against macular degeneration and promote eye health.

**Summary**

**Age-related macular degeneration** is the most common cause of vision loss in those over 50 years of age.

Two large meta-analyses confirm that a higher intake of **omega-3 fatty acids** from fish oil is protective against the development and progression of all forms of age-related macular degeneration. •

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**Carotenoids Also Protect the Retina**

Omega-3 fatty acids aren’t the only nutrients that have been found to be protective against eye disease.

**Carotenoid** pigments found in plants, such as **lutein**, **zeaxanthin**, and **meso-zeaxanthin** are known to concentrate in the outer membrane of the retina, where they provide structure support to the maculae and shield these delicate cells from harmful wavelengths of light that can damage the eye.

Population studies show that individuals with the highest concentration of carotenoids in the retina have lower rates of **macular degeneration**.22,23

In one study, those with the highest intake of **lutein** and **zeaxanthin** had a 41% lower risk of developing advanced macular degeneration.24

---

**References**

5. Jadeja RN, Martin PM. Oxidative Stress and Inflammation in Retinal Degeneration. *Antioxidants (Basel).* 2021 May 17;10(5).


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

It also maintains higher vitamin levels throughout the day.¹

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* Compared to CENTRUM Silver Adults 50+

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

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Comprehensive EYE HEALTH Formula

MacuGuard® Ocular Support provides:

> Lutein, trans-zeaxanthin, and meso-zeaxanthin help maintain structural integrity of the macula and retina.¹⁻⁵

> Saffron has been shown to help support vision as demonstrated by doctors’ eye exams.¹

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References


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Reduce Stress While Sharpening MENTAL FOCUS
A 2022 survey found that 27% of Americans reported being so stressed most days that they can’t function.1

Stress can leave us mentally lethargic and foggy.2

When stress becomes chronic, it can cause serious long-term damage and increase risk for heart disease, diabetes, depression, anxiety,3 and sleep problems.4

Searching for solutions, researchers identified a plant extract that decreased feelings of stress by 62%-79%.5

Researchers also identified a spearmint extract that boosted mental alertness and attention in two randomized controlled human studies.6,7

Together, these plant extracts may lower stress while increasing mental focus.
The Dangers of Stress

Chronic stress inflicts damage throughout the body.8

Untreated, stress can increase risk for:

- Heart disease and stroke,9,10
- Obesity,11
- Diabetes,12
- Osteoporosis,13
- Gastrointestinal complaints,10
- Mental health, including anxiety, depression,3 and insomnia,4 and
- Sexual dysfunction.14

One way the body responds to stress is by releasing cortisol, a hormone that keeps the stress response activated during chronic periods of stress.15

Research shows that an extract of the ashwagandha plant helps the body fight the negative effects of chronic stress.5,16

Ashwagandha Lowers Cortisol

Ashwagandha has been used in traditional Indian medicine for over 3,000 years to promote whole-body health.16,17

Chronic stress results in higher levels of cortisol, a hormone that helps regulate stress response. Chronically elevated cortisol levels can impact overall quality of life.15

Cortisol is regulated by the hypothalamic-pituitary-adrenal (HPA) axis. Normal activation of the HPA axis is necessary for a healthy response to stress. However, chronic stimulation of the HPA axis can lead to an erratic stress response. This can result in constant levels of cortisol being released into the body contributing to weight gain, heart disease, impaired memory, and other health problems.18

Ashwagandha acts as an adaptogen, a substance helping the body deal with physical manifestations of stress, like the release of cortisol, while restoring balance.19

Research suggests that ashwagandha inhibits cortisol release.5,20,21

Impressive Clinical Results

To validate these effects, scientists designed a randomized, placebo-controlled clinical trial.5

They divided chronically stressed individuals into four groups.

One group took a placebo while the other three took ashwagandha root and leaf extract in one of three doses:

- 125 mg once daily,
- 125 mg twice daily (total 250 mg), or
- 250 mg twice daily (total 500 mg).

A commonly-used anxiety scale showed that overall stress was decreased by 71% in the group that was given 125 mg of extract twice daily (250 mg total) for 60 days.5

After 60 days, the 125 mg twice daily (250 mg total) group had significantly decreased;5

- Serum cortisol,
- Serum C-reactive protein, a marker of inflammation,
- Pulse rate, and
- Blood pressure.
**Lower Stress, Boost Alertness**

- **Stress** can have devastating impacts on emotional and physical health.

- In a clinical trial, ashwagandha extract lowered stress by 71% and reduced levels of the stress hormone cortisol by 24.2%.

- Stress can also lead to feelings of mental fogginess.

- A patented spearmint extract has been clinically shown to improve attention, alertness, and reaction times.

- Taken together, these two plant extracts may lower stress and boost mental focus.

All participants taking ashwagandha, compared to placebo, reported reduced feelings of **stress** and **anxiety** and significant improvements in:

- Fatigue,
- Appetite loss,
- Feelings of “impending doom,”
- Inability to concentrate,
- Irritability,
- Forgetfulness, and
- Sleeplessness.

In the 125 mg twice daily (250 mg total) group, serum cortisol decreased by 24.2%.

**Boosting Mental Alertness**

Stress can make people feel mentally muddled. Often times, treatments for stress reduce alertness and induce drowsiness. Researchers turned to spearmint, which has been used traditionally to improve **alertness** and **memory**. They found a spearmint extract that uses a water process extraction method to preserve the high polyphenol content in this herb.

This polyphenol-rich spearmint extract contains a minimum of **14.5% rosmarinic acid** and a combination of **24% total polyphenols** that was shown to:

- Increase alertness and vigor,
- Improve working and spatial working memory, two aspects of **short-term memory**.

In this human study, subjects with age-associated memory impairment who took 900 mg of this specific spearmint extract for 90 days had, compared to a placebo, a roughly 15% improvement in working memory and a 9% improvement in spatial working memory. This suggests enhanced mental alertness.

In an open-label pilot trial, healthy adults taking 900 mg of spearmint significantly improved their attention and concentration just 2.25 hours after a single dose, demonstrating swift cognitive benefits.

**Clinically Validating Spearmint**

To elaborate on these findings, scientists conducted two randomized, placebo-controlled trials. In one study, healthy, active individuals aged 18-50 years took 900 mg of spearmint extract or a placebo daily.
Volunteers were tested using a high-tech, 360-degree platform surrounded by towers with multiple lights. Subjects had to lunge to make hand or foot contact with targets on the towers as software counted the “hits.”

This test measures reaction times when sudden changes in direction or speed are needed. It also measures choice reaction times—an indicator of the cognitive, more than the physical, aspects of reactive agility.

Those taking the spearmint extract had significant improvements in “hits” after just 30 days, showing enhanced mental agility.7

Improvements in Attention
Another placebo-controlled trial enlisted healthy, active volunteers aged 18-50 who took 900 mg of spearmint extract or a placebo daily.6 This time, cognition was assessed by computerized cognitive tests.

After 30 days, the spearmint group had an 8.8% increase in sustained attention as compared to placebo. After 90 days, 11% improvement was reported.6 No significant changes in sleep, mood, or quality of life were found, demonstrating that this spearmint extract does not disrupt these aspects of life.6

Combining this spearmint extract with ashwagandha may help reduce stress and increase alertness, with no potential side effects.

Summary
Stress reduces quality of life and increases risk of chronic disease.

In clinical trials, ashwagandha lowered feelings of stress and reduced cortisol levels.

Mental foginess, which may be stress-related, can impair cognition.

A water-processed spearmint extract improved reaction time, alertness, and sustained attention in clinical studies. •

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
L-ergothioneine is an amino acid found in mushrooms. Cell-based studies suggest that L-ergothioneine may support healthy longevity by:

- Protecting mitochondrial DNA function
- Delaying telomere shortening
- Supporting DNA function in cells subjected to UV exposure

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

One daily capsule provides as much L-ergothioneine as 2 to 5 cups of white button mushrooms.

References
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Ashwagandha Plus Calm & Focus reduces stress while increasing alertness-focus.

Each capsule contains:
- Standardized ashwagandha root and leaf extract clinically shown to decrease feelings of stress by 71%.1
- Patented polyphenol-rich spearmint extract clinically shown to improve alertness and sustained attention.2-4

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References:

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Protect Against Occlusive Arterial Plaque
Atherosclerosis can lead to heart attacks and strokes...the top causes of death worldwide.\(^1\)

Two plant extracts have been shown to inhibit the development and worsening of atherosclerosis and to reduce unstable plaque, the most dangerous form.

Placebo-controlled clinical studies reveal that when these extracts are combined, they work better than separately.

In one study, participants taking the two extracts experienced 95% less progression of plaque, compared to a control group receiving standard care.\(^2\)

Another study showed the extract blend led to an 82% reduction in major cardiovascular events, including heart attack and stroke.\(^3\)
Arterial Plaque

**Atherosclerosis** is a chronic, inflammatory vascular disease that involves plaque buildup on the inner walls of arteries, narrowing the opening and making the arteries stiff and inflexible.⁴

These plaques can be unstable and rupture.⁵ Atherosclerosis initiates and progresses for decades before symptoms develop.⁴,⁵ Conventional **risk factors** include:⁴

- Aging,
- Family history of cardiovascular disease,
- Abnormal lipid levels, including elevated LDL (“bad”) cholesterol, high triglycerides, and low HDL (“good”) cholesterol,
- High blood pressure,
- Elevated blood sugar,
- Obesity and sedentary lifestyle,
- Poor diet, and
- Smoking.

The process of plaque formation involves inflammation, necrosis, fibrosis, and calcification.⁷ When atherosclerotic plaques rupture, or when a blood clot (thrombus) forms on jagged plaque, the result can be catastrophic arterial occlusions. These blockages, either partial or complete, can cause a **heart attack** or an ischemic **stroke**.⁸

Two plant extracts have been shown to **inhibit** atherosclerosis: **Centella asiatica** and **French maritime pine bark**.

Centella Asiatica

*Centella asiatica* (also known as *gotu kola*) is a plant native to Asia. It has long been used in traditional medicine for various disorders and wound treatment.⁹

*Centella* contains compounds called **triterpenes**, which are believed to inhibit plaque by their anti-inflammatory activity.¹⁰ Triterpenes also stabilize more dangerous **soft plaque** by improving the synthesis of **collagen**,¹⁰-¹³ which holds soft plaque in place.¹¹,¹⁴,¹⁵

*Centella* also reduces the adhesion of **monocytes**, immune cells that promote atherosclerosis.¹⁵,¹⁶

In a clinical study of patients with soft plaque, taking **60 mg** of *Centella asiatica* extract three times daily for 12 months resulted in no increase in plaque size, compared to a **23%** increase in a **placebo** group.¹¹ The extract also produced a **63%** more firm plaque, which is associated with less rupture risk.¹¹

Pine Bark

**French maritime pine bark** contains compounds known as **procyanidins** and **phenolic acids**.¹⁷,¹⁸

In multiple clinical studies, these compounds have been shown to slow atherosclerosis progression,¹⁸ an effect that may result, in part, from reduced expression of inflammatory signaling molecules that contribute to plaque formation.¹⁹,²⁰

In a clinical study of patients with coronary artery disease, those taking **200 mg** of **French maritime pine bark** extract daily for eight weeks had increased **flow-mediated dilation** (a measure of beneficial arterial widening) by **32%**. There were **no** significant changes in the **placebo** group.²¹
Combined Effects

The effects of these extracts were even more impressive when they were combined. In one clinical study, individuals aged 45 to 60 whose plaques were a relatively mild class IV all received diet and lifestyle counseling. Participants were also randomized into six groups to receive either:

- Lifestyle counseling,
- Lifestyle counseling plus 100 mg of aspirin,
- Lifestyle counseling plus 50 mg of standardized French maritime pine bark,
- Lifestyle counseling plus 100 mg of standardized French maritime pine bark,
- Lifestyle counseling plus 100 mg standardized French maritime pine bark with 100 mg aspirin, or
- Lifestyle counseling plus 100 mg of French maritime pine bark extract with 100 mg of Centella asiatica extract.

The percentage of plaques that worsened to class V, blocking more than 50% of an artery, was:2

- 21.3% in those receiving only lifestyle and diet counseling, but only
- 1.1% in those receiving the dual extracts (pine bark + Centella asiatica).

WHAT YOU NEED TO KNOW

Scientists gave the same dosages to a group of patients with class V plaques (more than 50% blockage of at least one major artery). After 42 months, the percentage of subjects whose plaques progressed to class VI, which involves symptoms such as numbness, tingling, or chest pain, was:22

- 48.0% in those who received lifestyle counseling only, and
- 6.5% in subjects receiving pine bark and Centella asiatica.

The extract blend led to 7.4 times lower progression of the disease over the study period of 42 months. In addition, cardiovascular events (hospitalization, chest pain, heart attack, or stroke) occurred in 4.4% of the combination extract group, as compared to 16% in the standard care group.22

Reduce Heart Attack and Stroke Risk

- Atherosclerosis, plaque in the arteries, frequently leads to strokes or heart attacks. It is the leading cause of death worldwide.
- Extracts of French maritime pine bark and Centella asiatica safely target this dangerous condition.
- Clinical studies show that, taken together, these extracts slow, and even reverse plaque accumulation, while boosting the stability of dangerous soft plaque to help prevent a deadly rupture.
- In a clinical study, this dual extract blend led to 7.4 times lower progression of the disease.
Additional Clinical Validation

In two more clinical trials, scientists used a combination of 150 mg of French maritime pine bark extract and 450 mg of Centella asiatica extract daily, along with 100 mg of aspirin, which is often recommended for those with atherosclerosis.³,²³

In one of these studies, patients with atherosclerotic plaque were monitored for three years. All subjects received standard diet, lifestyle, and exercise counseling. A control group received no additional treatment, a second group was given only aspirin, and a third received aspirin plus the dual-extract blend.³

Plaque progression was observed in 5.3% of those in the dual-extract group, but it was found in over 20% of the two groups that did not receive the extracts. Major cardiovascular events (such as heart attack or stroke requiring hospitalization), occurred in:³

- 22% of the control group, but
- Less than 4% of those taking the extracts and aspirin.

Another study investigated calcification of coronary arteries. Participants were randomized into three groups to receive either:

- Standard counseling and 100 mg of aspirin daily,
- Standard counseling with 150 mg of French pine bark extract, or
- Standard counseling with 150 mg of French pine bark and 450 mg of Centella extract daily.²³

After 12 months, the number of calcifications:²³

- Increased by 35% in those receiving counseling and aspirin, but
- Decreased by 10% in those taking 150 mg of French pine bark and 450 mg of Centella extract.

Enhanced Plaque Stability

Some plaques are worse than others.

In a six-month clinical study of patients with atherosclerotic plaques, mild hypertension, and elevated cholesterol, subjects were divided into a lifestyle counseling group, a group that received the two herbal extracts, and a group that received both. Ultrasound imaging was used to assess plaque stability.²⁴

In patients receiving only lifestyle counseling, plaque stability did not change significantly over six months.

But in patients receiving 150 mg of French maritime pine bark extract and 450 mg of Centella asiatica extract daily, the plaque stability index doubled. This means their plaques were less likely to rupture and induce catastrophic clotting.²⁴

Plaque size and number also decreased significantly in treated individuals.

Summary

Plaque accumulation in arteries is the signature characteristic of atherosclerosis, the underlying cause of most heart attacks and strokes.

Scientists have identified two plant extracts that target atherosclerosis and its consequences.

A blend of French maritime pine bark and Centella asiatica extracts has been shown to slow plaque growth, while boosting stability of deadly soft plaque, to help prevent a rupture.

This dual extract blend reduced progression of arterial plaque by as much as 95% in a clinical study.

When used together, these extracts have been shown to help slow the development and progression of atherosclerosis, when combined with therapeutic lifestyle modification. •

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

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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.

Impact of NAD+ on HEALTHY LONGEVITY
BY STEVEN LAWRENCE

**NAD** is found in every living cell, from bacteria to humans.¹

It is required for many reactions that provide energy and for essential processes such as repairing DNA.²⁻⁴

The problem is that levels of NAD⁺ decline as we age.⁵

A nutrient called nicotinamide riboside has been shown to boost cellular NAD⁺.

Preclinical studies show that this could support brain,⁶⁻⁸ heart,⁸ and metabolic health.⁹⁻¹⁰

In organisms ranging from yeast to worms to mice, replenishing NAD⁺ with nicotinamide riboside has been found to extend lifespan.¹¹⁻¹⁴

In one study, elderly mice given nicotinamide riboside experienced a 5% increase in lifespan.¹⁴

For an average American, a 5% lifespan extension might mean four additional years of life.¹⁵

A review published in 2022 describe the systemic effects of NAD⁺ metabolism on cellular aging processes.²
This decline in NAD⁺ leads to deteriorating cellular health. Sirtuins and other cell protectors that rely on NAD⁺ cannot function properly with insufficient NAD⁺ and cannot offer the defenses that sirtuins provide in youth.¹⁶

There’s a way to boost NAD⁺ back to healthier levels. Scientists discovered that a form of vitamin B3 called nicotinamide riboside acts as a NAD⁺ precursor when taken orally.¹¹,¹³,¹⁴

It is readily taken up by cells, which use it to produce more NAD⁺ and improve body levels of NAD⁺.²⁰,²¹

In humans, oral supplementation of nicotinamide riboside 250 mg a day titrated up to 1,000 mg twice daily was found to raise NAD⁺ levels by 2- to 7-fold.²²

Benefits of Boosting NAD⁺

Ample NAD⁺ levels can contribute to many different areas of health, as suggested by preclinical studies, including:

- **Genetic Health.** Damage to DNA can cause rapid aging and chronic diseases. By supporting sirtuins and other enzymes, NAD⁺ helps bolster cellular defenses to prevent this damage and even repair existing DNA damage. It also protects the function of telomeres, caps at the ends of chromosomes that are associated with longer life.³,⁸,¹⁶,¹⁷,²³

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### NAD⁺ and Cellular Function

NAD⁺ (nicotinamide adenine dinucleotide) is a coenzyme that is essential to sustaining healthy life.¹⁶

It is critical for the basic metabolism and energy supply of all cells. It is required for the normal function of over 300 proteins, including many vitally important ones.³

For example, sirtuins are a group of proteins that regulate cellular repair and defenses and help maintain cellular health.

*Low sirtuin activity* is tied to accelerated aging and risk for age-related issues. Preclinical studies have shown that boosting sirtuin function rejuvenates cells, repairs damage to DNA, and much more.⁵,¹⁶,¹⁷

Sirtuins require NAD⁺ to function.¹⁵ For this reason, cells need an ongoing supply of NAD⁺ at all times to function optimally.

### Nicotinamide Riboside Raises NAD⁺ Levels

NAD⁺ production drops significantly with advancing age.⁵,¹⁸

A study using human skin samples from people across a wide age range found that NAD⁺ levels had declined markedly in people aged 30-50, compared to infants from birth to the age of one year.

In the study subjects over age 50, NAD⁺ levels in skin were reduced by more than 87% compared to the infants.¹⁹

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### NAD⁺ and Resveratrol Work Together

Resveratrol is a polyphenol found in red wine and various plants. It has well-documented benefits that help prevent age-related disease and slow the aging process.³⁸

One of the key ways resveratrol works is by activating life-extending cellular sirtuins.³⁹-⁴²

Because sirtuins require NAD⁺ to function, resveratrol’s benefits cannot be maximized without also ensuring ample NAD⁺ levels.

Taken together, resveratrol and nicotinamide riboside can boost each other’s benefits.
• **Energy Metabolism.** NAD⁺ plays a central role in breaking down nutrients to supply energy to cells. Without it, cells suffer energy failure and cannot survive.²⁻⁴

• **Cellular Protection.** Oxidative stress and chronic inflammation have both been tied to virtually every age-related disease. Maintaining adequate NAD⁺ combats both, inhibiting inflammation while aiding cellular antioxidant defenses.¹⁷,²⁴

• **Stem Cell Health.** Healthy stem cells help maintain youthful tissue function, replacing old, damaged cells with healthy new ones. In animal model studies, both NAD⁺ and sirtuins have been found to improve stem cell health.¹⁴,²⁵-²⁷

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**Health Benefits of Nicotinamide Riboside**

- Every living cell relies on NAD⁺ for hundreds of cellular processes, including energy production, DNA repair, and sirtuin activity.

- NAD⁺ levels drop with age. Boosting NAD⁺ has been shown to protect cellular health, prevent age-related chronic disease, and extend lifespan in model organisms.

- **Nicotinamide riboside** is a NAD⁺ precursor that can be taken orally and raises NAD⁺ levels in humans and animal models.

- By boosting NAD⁺ levels, nicotinamide riboside has demonstrated the ability in preclinical studies to support longevity, improve organ function, and reduce risk for age-related chronic disease.
Nicotinamide Riboside Promotes Longevity

Scientists have consistently found in preclinical studies that NAD⁺-boosting **nicotinamide riboside** is capable of improving overall health, including the brain, heart, and blood vessels.

For example, in rodent studies, **nicotinamide riboside**:

- Reverses cognitive deficits and improves memory in models of Alzheimer's disease.
- Helps prevent the development of heart failure,
- Improves metabolism and helps prevent weight gain.

A range of preclinical models have demonstrated that increasing nicotinamide riboside NAD⁺ levels can **extend lifespan**.

Yeast grown with nicotinamide riboside have an extended lifespan. In worms, lifespan is extended at least 10%. Giving **nicotinamide riboside** to mice that were the human equivalent of 70 years old extended their lives by about 5%.

A 5% extended lifespan in a person might mean gaining nearly **four additional years** of life based on today's average U.S. human life expectancy of roughly 76 years.

Clinical Trials

Impressed by animal studies showing benefits for boosting NAD⁺, scientists began conducting **clinical studies** with **nicotinamide riboside** to see if it translates to humans. Here is a sampling of human trials:

- A double blinded phase 1 clinical trial of newly diagnosed Parkinson's disease patients received 1,000 mg or placebo for 30 days. Participants receiving nicotinamide riboside showed an increase in brain NAD⁺ levels and mild improvement of clinical symptoms.
- In a double-blind, crossover trial, aged men received 1,000 mg nicotinamide riboside per day for 21 days. After 21 days, elevated levels of NAD⁺ in muscles of participants in the intervention group were seen. Nicotinamide riboside also reduced levels of circulating inflammatory cytokines.
• In a clinical trial of 30 participants with clinically stable heart failure and reduced ejection fraction, a 1,000 mg twice daily dose of nicotinamide riboside was well tolerated and resulted in boosting blood levels of NAD⁺ to approximately double the level at baseline and reduced white blood cell expression of markers of systemic inflammation.³⁶

• In a double blind, crossover study, 12 young and 12 aged individuals were randomized to receive nicotinamide riboside or placebo. Two hours before and after the supplementation, blood and urine samples were collected. At that time muscle fatigue and strength were assessed. Nicotinamide riboside supplementation showed increased NAD⁺ levels. Interestingly, supplementation improved physical performance only in elderly subjects.³⁷ The conclusion from this finding indicates that declining NAD⁺ levels due to age can be replenished with nicotinamide riboside supplementation, resulting in improved exercise performance.

Summary

NAD⁺ is a crucial compound in every living cell. It is involved in the basic energy supply all cells need to thrive. It is also required for cellular regulators like sirtuins to help protect against rapid aging. NAD⁺ levels drop dramatically with age, contributing to accelerated aging.

Nicotinamide riboside is a NAD⁺ precursor. Taken orally, it quickly boosts cellular NAD⁺ levels. In preclinical studies, nicotinamide riboside is tied to improved organ function and longer life.●

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


7. Campbell JM. Supplementation with NAD(+) and Its Precursors to Prevent Cognitive Decline across Disease Contexts. Nutrients. 2022 Aug 7;14(15).


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

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For maximum absorption each enteric coated tablet contains two layers:

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- **Glucoraphanin** from broccoli, watercress, cabbage and rosemary (sulforaphane precursors), in the other layer.

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Cistanche Promotes Healthy Aging

BY LAURIE MATHENA

Cistanche is a medicinal herb that has been used in traditional Chinese medicine to support many different functions, including brain health.1-3

More recently, scientists have identified Cistanche’s potential for fighting cancer, reversing bone loss, and even boosting lifespan.

Together, this research adds to the growing body of evidence that oral intake of Cistanche could promote healthier aging.4-6

Optimizing Immune Function

Maintaining healthy immune function is one of the best ways to enhance health and longevity.7

Immune function begins to malfunction as we age. Called immune senescence, this dysfunction increases the risk of infections and cancer, while also reducing the effectiveness of vaccines.8

One prime cause of the immune dysfunction suffered by the elderly is a marked decrease in naïve T cells9-11 and functional natural killer cells,11,12 along with an increase in pro-inflammatory cytokines.11
In human cell studies, and also in animal studies, *Cistanche* has been shown to target these aspects of immune senescence: 4,13

- It increased naïve T cells and natural killer (NK) cells, and
- Decreased the pro-inflammatory cytokine interleukin 6.

An animal study demonstrated that injection of a *Cistanche* extract along with a seasonal influenza vaccine helped improve the immune response to the vaccine. The addition of the Cistanche extract resulted in more rapid antibody production and more effective T-cell response to the flu antigens.14

This indicates that *Cistanche* extract has the potential to increase the immune response to an influenza vaccine.

Finally, there’s evidence from preclinical studies that *Cistanche* may have anti-inflammatory activity15 that could support proper immune system function.6,13

### Potent Cognitive Protection

While *Cistanche* has been studied in multiple preclinical settings for its potential immune health benefits, a human study revealed that it could be an unsung hero for brain health as well.

In a placebo-controlled pilot study, 26 men and women with moderate Alzheimer’s disease were randomized to three groups. Two treatment groups received either *Cistanche* extract capsules or Donepezil (prescription medication to improve cognition in Alzheimer’s patients), the third group received a placebo. The *Cistanche* treatment group took 300 mg of *Cistanche* three times daily for nearly a year.16

Compared to the untreated group, those taking *Cistanche* had significantly lower levels of certain inflammatory factors in the fluid surrounding their brain and spinal cord.

*Cistanche* also appeared to protect the brain from shrinkage.

In the untreated subjects, hippocampus volume shrank by 4.2%. This is concerning, since this area of the brain plays a key role in cognition, memory, and learning.

The *Cistanche* group, on the other hand, had no change in the volume of their hippocampus.

Consistent with these findings, the *Cistanche* group performed significantly better on cognitive tests at the end of the study.16

These benefits could be due in part to a beneficial polyphenol in *Cistanche* called echinacoside.13,17

In a rat model of Alzheimer’s, echinacoside and other bioactive components of *Cistanche* were found to pass through the blood-brain barrier.2

### Cancer-Fighting Potential

Preclinical research suggests *Cistanche* has activity against numerous types of cancer. Studies have demonstrated that *Cistanche*:

- Inhibits growth of breast cancer cells,19
- Inhibits growth of colorectal cancer cells,13 and
- Induces apoptosis and cell cycle arrest in esophageal cancer cells.20

In hepatocellular carcinoma, the most common type of liver cancer, a mouse study showed that *Cistanche* increased levels of cancer-fighting CD8+ T cells, inhibited the growth of liver cancer cells, and greatly improved the rodents’ survival rate.21 Another rat study showed *Cistanche* inhibited hepatocellular carcinoma cell growth in a dose-dependent manner.22

In an impressive lab study, *Cistanche* inhibited the growth of colon cancer cells by 60% within just 72 hours of treatment. This included primary and metastatic colon cancer cells.23

### Longevity Effects

*Cistanche* has been shown to significantly boost lifespan in fruit flies and roundworms. Scientists use these species because their short lifespan allows them to quickly test lifespan effects of a compound.
In one study, when adult fruit flies were given Cistanche extract for 20 days, it extended their average lifespan by as much as 18.5%. In another study, the echinacoside found in Cistanche increased the average lifespan of roundworms by 13.64%, compared to an untreated group.

Cistanche has also been shown to boost the secretion of growth hormone in rat pituitary cells. This could impact lifespan since growth hormone declines with age.

Exciting studies also show the potential of Cistanche to impact longevity factors and increase lifespan. Together, this research adds to the growing body of evidence that oral intake of Cistanche may promote healthier aging.

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

References


Latest Studies

Research continues to reveal new and diverse benefits of Cistanche. In just the past six years alone, animal studies and preclinical research studies have revealed Cistanche’s potential ability to:

- Reverse bone loss and improve bone density,
- Improve insulin resistance and promote healthy blood sugar levels,
- Treat or prevent depression,
- Lower cholesterol,
- Combat physical fatigue,
- Support reproductive health,
- Alleviate constipation, and
- Reduce the severity of cataracts.

Summary

Extracts of the herb Cistanche contain bioactive compounds that could support immune function, protect brain health, help fight cancer, reverse bone loss, and more.
Feel like a Kid Again

If you experience general fatigue, it may be due to the decline of NAD⁺, an important coenzyme found in every cell.

NAD⁺ facilitates the production of ATP, which your body uses for fuel.

NAD⁺ Cell Regenerator™ formulas help maintain youthful levels of NAD⁺.

NAD⁺ Cell Regenerator™ and Resveratrol
Nicotinamide riboside (300 mg), trans-resveratrol and other cell-energizing nutrients in one capsule.
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NAD⁺ Cell Regenerator™
300 mg of nicotinamide riboside per capsule.
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* For pricing available to readers of this magazine, call 1-800-544-4440 or visit LifeExtension.com/NAD

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

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Ages ago, fermentation was a practical process that extended the shelf life of vegetables while boosting the flavor and aroma of the food. But this process also changes a *health* food into a true *superfood*.

During fermentation, bacteria and yeast break down sugars into an acid. This produces a probiotic-rich food that promotes a healthy, balanced microbiome.1

As a result, there are benefits of fermented foods throughout the body, as thousands of studies have demonstrated.

One specific type of fermented food is *kimchi*, a Korean dish that most often contains cabbage, and that has a unique blend of salty, sour, and savory notes.

Kimchi is a source of protein and fiber.1 A test-tube study showed that a main compound found in kimchi (called HDMPPA) had anti-inflammatory properties.2 A mouse study showed that this compound improved blood vessel function by supporting nitric oxide production and reducing inflammation.3

Numerous studies indicate that consuming kimchi can help support metabolic health and promote weight loss.

For example, when 100 people consumed 15 grams to 210 grams of kimchi daily for just one week, they experienced decreases in blood sugar and total cholesterol. The greater the amount consumed, the greater the benefit.4

In a study of 22 overweight people, adding kimchi to their diets for four weeks led to reductions in body weight, body mass index, and body fat.5 Individuals also saw decreased blood sugar levels and improvements in blood pressure readings.

Kimchi could even impact aging itself. In a study of human cells, treating them with kimchi increased their viability and extended their overall lifespan.6

Many grocery stores carry kimchi in the produce aisle. You can also find recipes online to make your own homemade kimchi.

**References**

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Cistanche for Systemic Health

Cistanche, an herb used in traditional Chinese medicine, has been shown in animal studies to:

• Promote longevity
• Support immune cells such as naïve T and natural killer cells
• Provide neuroprotection

References

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

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

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

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- Support you to walk farther and faster
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Rapamycin’s Role in Fighting Aging

Some of the most promising advances in anti-aging science involve the drug rapamycin and its effects on a cellular protein called mTOR and the process of autophagy, or “cellular housekeeping.”

In this interview, Life Extension discusses the latest research with pharmacist Ross Pelton, who recently published the second edition of his book, *Rapamycin, mTOR, Autophagy & Treating mTOR Syndrome.*

**Life Extension:** Can you explain what mTOR and autophagy are?

**Ross Pelton:** mTOR and autophagy are the yin and yang of cellular metabolism. mTOR is a protein that initiates growth signals in cells when nutrients are available. When nutrients are not available, autophagy is activated. Autophagy breaks down and removes old or damaged cellular components, which is critical for rebuilding and renewal of the body.¹,²
ASK THE AUTHOR

**LE:** In the new edition of your book, you propose the mTOR/Autophagy Theory of Aging. What is that?

**Pelton:** For millions of years of human evolution, the mTOR/autophagy ratio was about 1:4. That means mTOR was activated approximately 20% of the time while autophagy was activated about 80% of the time.

These days, the ratio is reversed. Most people have mTOR activated about 80% each day and only about 20% autophagy. This reversal is largely due to drastic changes in the amount of time modern humans spend consuming calories every day compared to our ancestors.

This mTOR/autophagy imbalance is associated with common diseases including cancer, Alzheimer’s and Parkinson’s diseases, obesity and diabetes, and cardiovascular disease. Recent studies confirm that under-activation of autophagy is a fundamental cause of metabolic dysfunction and accelerated biological aging.

**LE:** How can we correct the under-activation of autophagy?

**Pelton:** Rapamycin is a drug approved by the FDA to treat some cancers and prevent organ transplant rejection. Its ability to activate autophagy is a major aspect of its ability to increase healthspan and lifespan.

**LE:** Are there specific conditions rapamycin can help prevent?

**Pelton:** I wrote a chapter in the second edition of my book on sarcopenia, the loss of muscle mass and strength in older adults. Sarcopenia results in loss of function and greater risk of falls, fractures, hospitalizations, and death. Three interventions that have been shown to delay the onset of sarcopenia are strength training, dietary protein, and rapamycin.

Strength training helps build muscle mass and delay the onset of physical disability. Dietary protein is required for muscle protein synthesis. By activating autophagy, rapamycin clears out old, damaged proteins, setting the stage for new muscle protein synthesis when mTOR is reactivated.

**LE:** Does rapamycin have other anti-aging benefits?

**Pelton:** A paper published in 2021 documented that rapamycin reduces translation errors in protein synthesis. Increased fidelity of protein synthesis extends lifespan in several animal models. This represents another way rapamycin improves health and extends lifespan, independent of its effect on mTOR and autophagy.

**LE:** Is there additional evidence supporting the use of rapamycin to extend lifespan?

**Pelton:** I reported on a study conducted by Vera Gorbunova, PhD, co-director of the Rochester Aging Research Center. Her research focuses on the genomes of exceptionally long-lived mammals, which have many genes in common that affect lifespan.

Dr. Gorbunova examined 10 prominent life extension therapies in mice and assessed how each affected the genes associated with maximum lifespan.
Of the 10, rapamycin had the greatest effect on activation of genes associated with maximum lifespan. It also had the lowest effect on activation of genes that negatively affect lifespan.

This study provides strong support for the claim that rapamycin is an effective life extension drug.

**LE:** Who can benefit from rapamycin?

**Pelton:** I think most adults aged 50 and older can gain significant health benefits from taking rapamycin. Individuals with certain medical conditions such as obesity might benefit by starting at a younger age, but these decisions need to be made with a physician. Pregnant women should not take rapamycin.

**LE:** What motivated you to write a second edition of your first RAPAMYCIN book?

**Pelton:** I was pleasantly surprised by the continuing number of published studies that corroborate what I wrote just a few years prior about rapamycin, mTOR, and autophagy. What inspired me the most are newly identified mechanisms of action to explain the ability of rapamycin to extend lifespan while combating the most prevalent diseases afflicted aging humans.

**References**


9. Available at: https://www.youtube.com/watch?v=q0ZY1VoV0s0. Accessed June 13, 2023.

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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Men need nutrition that’s custom-fitted to support sexual health, testosterone levels, and even prostate-urinary function.

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- **01727** Bone Restore with Vitamin K2
- **01725** Bone Strength Collagen Formula
- **01963** Calcium Citrate with Vitamin D
- **01506** Dr. Strum’s Intensive Bone Formula
- **02417** Mega Vitamin K2
- **01476** Strontium Caps

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- **01706** Extraordinary Enzymes
- **02100** Gastro-Ease™

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- **00889** Rhodiola Extract
- **02003** Triple Action Thyroid

### EYE HEALTH

- **01923** Astaxanthin with Phospholipids
- **00893** Brite Eyes III
- **02323** Digital Eye Support
- **01514** Eye Pressure Support with Mirtogenol®
- **01992** MacuGuard® Ocular Support with Saffron
- **01993** MacuGuard® Ocular Support with Saffron & Astaxanthin
- **01873** Standardized European Bilberry Extract
- **01918** Tear Support with MaquiBright®
<table>
<thead>
<tr>
<th>FISH OIL &amp; OMEGAS</th>
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<tbody>
<tr>
<td>01937  Mega EPA/DHA</td>
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<tr>
<td>02218  Mega GLA Sesame Lignans</td>
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<tr>
<td>01983  Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract • 60 softgels</td>
</tr>
<tr>
<td>01988  Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill &amp; Astaxanthin</td>
</tr>
<tr>
<td>01982  Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract • 120 softgels</td>
</tr>
<tr>
<td>01985  Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract • 60 enteric coated softgels</td>
</tr>
<tr>
<td>01988  Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill &amp; Astaxanthin</td>
</tr>
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<td>01982  Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract • 120 enteric coated softgels</td>
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<tr>
<td>01986  Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract • 240 softgels</td>
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<tr>
<td>01812  Provinal® Purified Omega-7</td>
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<tr>
<td>01640  Vegetarian DHA</td>
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<tbody>
<tr>
<td>02008  California Estate Extra Virgin Olive Oil</td>
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<tr>
<td>02170  Rainforest Blend Decaf Ground Coffee</td>
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<tr>
<td>02169  Rainforest Blend Ground Coffee</td>
</tr>
<tr>
<td>02171  Rainforest Blend Whole Bean Coffee</td>
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<thead>
<tr>
<th>GLUCOSE MANAGEMENT</th>
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<tbody>
<tr>
<td>01503  CinSulin® with InSea® and Crominex® 3+</td>
</tr>
<tr>
<td>01620  CoffeeGenic® Green Coffee Extract</td>
</tr>
<tr>
<td>02122  Glycemic Guard™</td>
</tr>
<tr>
<td>00925  Mega Benfotiamine</td>
</tr>
<tr>
<td>01803  Tri Sugar Shield®</td>
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<tr>
<th>HEART HEALTH</th>
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<tbody>
<tr>
<td>01066  Aspirin (Enteric Coated)</td>
</tr>
<tr>
<td>01842  BioActive Folate &amp; Vitamin B12 Caps</td>
</tr>
<tr>
<td>01700  Cardio Peak™</td>
</tr>
<tr>
<td>02121  Homocysteine Resist</td>
</tr>
<tr>
<td>02508  Omega-3 Fish Oil Gummy Bites</td>
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<tr>
<td>02018  Optimized Carnitine</td>
</tr>
<tr>
<td>01949  Super-Absorbable CoQ10 Ubiquinone with d-Limonene • 50 mg, 60 softgels</td>
</tr>
<tr>
<td>01951  Super-Absorbable CoQ10 Ubiquinone with d-Limonene • 100 mg, 60 softgels</td>
</tr>
<tr>
<td>01929  Super Ubiquinol CoQ10</td>
</tr>
<tr>
<td>01427  Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 30 softgels</td>
</tr>
<tr>
<td>01425  Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 100 softgels</td>
</tr>
<tr>
<td>01437  Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 30 softgels</td>
</tr>
<tr>
<td>01426  Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 60 softgels</td>
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<tr>
<td>01431  Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 200 mg, 30 softgels</td>
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<tr>
<td>01733  Super Ubiquinol CoQ10 with PQQ</td>
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<tr>
<td>01859  TMG Liquid Capsules</td>
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<td>00349  TMG Powder</td>
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<tr>
<th>HORMONE BALANCE</th>
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<tbody>
<tr>
<td>00454  DHEA • 15 mg, 100 capsules</td>
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<tr>
<td>00335  DHEA • 25 mg, 100 capsules</td>
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<tr>
<td>00882  DHEA • 50 mg, 60 capsules</td>
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<tr>
<th>IMMUNE SUPPORT</th>
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<tbody>
<tr>
<td>02411  Day Elderberry Immune</td>
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<tr>
<td>02302  Bio-Quercetin</td>
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<tr>
<td>02410  Black Elderberry + Vitamin C</td>
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<tr>
<td>02433  Echinacea Elite</td>
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<tr>
<td>01961  Enhanced Zinc Lozenges</td>
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<tr>
<td>01704  Immune Modulator with Tinofend®</td>
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<tr>
<td>02425  Immune Packs with Vitamin C &amp; D, Zinc and Probiotic</td>
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<tr>
<td>02005  Immune Senescence Protection Formula™</td>
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<tr>
<td>01681  Lactoferrin (Apolactoferrin) Caps</td>
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<tr>
<td>02426  Mushroom Immune with Beta Glucans</td>
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<tr>
<td>01903  NK Cell Activator™</td>
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<tr>
<td>01394  Optimized Garlic</td>
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<tr>
<td>01309  Optimized Quercetin</td>
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<tr>
<td>01811  Peony Immune</td>
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<tr>
<td>01708  Reishi Extract Mushroom Complex</td>
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<tr>
<td>01906  Standardized Cistanche</td>
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<td>01097  Ultra Soy Extract</td>
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<td>01561  Zinc Lozenges</td>
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<thead>
<tr>
<th>INFLAMMATION MANAGEMENT</th>
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<tbody>
<tr>
<td>01639  5-LOX Inhibitor with AprèsFlex®</td>
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<tr>
<td>02324  Advanced Curcumin Elite™ Turmeric Extract, Ginger &amp; Turmerones</td>
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<tr>
<td>01709  Black Cumin Seed Oil</td>
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<tr>
<td>02310  Black Cumin Seed Oil and Curcumin Elite™</td>
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<tr>
<td>02467  Curcumin Elite™ Turmeric Extract 30 veg capsules</td>
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<td>02407  Curcumin Elite™ Turmeric Extract 60 veg capsules</td>
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<td>01804  Cytokine Suppress® with EGCG</td>
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<td>02223  Pro-Resolving Mediators</td>
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<td>56886  Restore Activ Joint Muscle &amp; Tissue</td>
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<td>01203  Specially-Coated Bromelain</td>
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<tr>
<td>00407  Super Bio-Curcumin® Turmeric Extract</td>
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<th>JOINT SUPPORT</th>
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<tbody>
<tr>
<td>02404  Arthro-Immune Joint Support</td>
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<tr>
<td>02238  ArthroMax® Advanced NT2 Collagen™ &amp; AprèsFlex®</td>
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<tr>
<td>01617  ArthroMax® with Theaflavins &amp; AprèsFlex®</td>
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<td>02138  ArthroMax® Elite</td>
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<td>00965  Fast-Acting Joint Formula</td>
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<td>02430  Fast Acting Relief</td>
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<td>00522  Glucosamine/Chondroitin Capsules</td>
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<td>02420  Glucosamine Sulfate</td>
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<td>02424  Joint Mobility</td>
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<td>01600  Krill Healthy Joint Formula</td>
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<td>00451  MSM (Methylsulfonylmethane)</td>
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<td>02231  NT2 Collagen™</td>
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<td><strong>KIDNEY &amp; BLADDER SUPPORT</strong></td>
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<tr>
<td>00862 Cran-Max® Cranberry Whole Fruit Concentrate</td>
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<td>01921 Uric Acid Control</td>
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<td>01209 Water-Soluble Pumpkin Seed Extract</td>
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<td><strong>LONGEVITY &amp; WELLNESS</strong></td>
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<td>00457 Alpha-Lipoic Acid</td>
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<td>02414 Bio-Fisetin</td>
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<tr>
<td>01214 Blueberry Extract</td>
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<td>01438 Blueberry Extract and Pomegranate</td>
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<td>00954 Mega Green Tea Extract (decaffeinated)</td>
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<td>01513 Optimized Fucoidan with Maritech® 926</td>
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<td>02230 Optimized Resveratrol Elite™</td>
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<td>01637 Pycnogenol® French Maritime Pine Bark Extract</td>
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<td>02210 Resveratrol Elite™</td>
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<td>02301 Senolytic Activator®</td>
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<td>01208 Super R-Lipoic Acid</td>
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<td>01919 X-R Shield</td>
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<td><strong>LUNG HEALTH</strong></td>
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<td>02512 Healthy Lungs</td>
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<td><strong>MEN’S HEALTH</strong></td>
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<td>02209 Male Vascular Sexual Support</td>
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<td>00455 Mega Lycopene Extract</td>
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<td>02306 Men’s Bladder Control</td>
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<td>02515 Men’s Vitality Packs</td>
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<tr>
<td>01789 PalmettoGuard® Saw Palmetto and Beta-Sitosterol</td>
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<td>01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula and Beta-Sitosterol</td>
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<td>01837 Pom-T®</td>
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<td>01373 Prelox® Enhanced Sex for Men</td>
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<td>01940 Super MiraForte with Standardized Lignans</td>
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<td>02500 Testosterone Elite</td>
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<td>01909 Triple Strength ProstaPollen™</td>
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<td>02029 Ultra Prostate Formula</td>
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<td><strong>MULTIVITAMINS</strong></td>
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<td>02199 Children’s Formula Life Extension Mix™</td>
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<td>02354 Life Extension Mix™ Capsules</td>
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<td>02364 Life Extension Mix™ Capsules without Copper</td>
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<tr>
<td>02356 Life Extension Mix™ Powder</td>
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<tr>
<td>02355 Life Extension Mix™ Tablets</td>
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<tr>
<td>02357 Life Extension Mix™ Tablets with Extra Niacin</td>
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<tr>
<td>02292 Once-Daily Health Booster 30 softgels</td>
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<tr>
<td>02291 Once-Daily Health Booster 60 softgels</td>
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<td>02313 One-Per-Day Tablets</td>
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<tr>
<td>02428 Plant-Based Multivitamin</td>
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<tr>
<td>02317 Two-Per-Day Capsules 60 capsules</td>
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<tr>
<td>02314 Two-Per-Day Capsules 120 capsules</td>
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<tr>
<td>02316 Two-Per-Day Tablets 60 tablets</td>
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<tr>
<td>02315 Two-Per-Day Tablets 120 tablets</td>
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<tr>
<td><strong>NERVE &amp; COMFORT SUPPORT</strong></td>
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<tr>
<td>02202 ComfortMAX™</td>
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<tr>
<td>02303 Discomfort Relief</td>
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<tr>
<td><strong>PERSONAL CARE</strong></td>
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<tr>
<td>02304C Youthful Collagen</td>
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<tr>
<td>02252 Youthful Legs</td>
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PET CARE
01932 Cat Mix
01931 Dog Mix

PROBIOTICS
01622 Bifido GI Balance
01825 FLORASSIST® Balance
02421 FLORASSIST® Daily Bowel Regularity
02125 FLORASSIST® GI with Phage Technology
01821 FLORASSIST® Heart Health
02250 FLORASSIST® Mood Improve
02208 FLORASSIST® Immune & Nasal Defense
02120 FLORASSIST® Oral Hygiene
02203 FLORASSIST® Prebiotic
02505 FLORASSIST® Probiotic Women’s Health

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

SLEEP
01512 Bioactive Milk Peptides
02300 Circadian Sleep
01551 Enhanced Sleep with Melatonin
01511 Enhanced Sleep without Melatonin
02234 Fast-Acting Liquid Melatonin
01669 Glycine
02308 Herbal Sleep PM
01722 L-Tryptophan
01668 Melatonin • 300 mcg, 100 veg capsules
01083 Melatonin • 500 mcg, 200 veg capsules
00329 Melatonin • 1 mg, 60 capsules
02503 Melatonin • 3 mg, 60 gummies
00330 Melatonin • 3 mg, 60 veg capsules
00331 Melatonin • 10 mg, 60 veg capsules
00332 Melatonin • 3 mg, 60 veg lozenges
02201 Melatonin IR/XR
01787 Melatonin 6 Hour Timed Release
01788 Melatonin 6 Hour Timed Release
01721 Optimized Tryptophan Plus
01445 Quiet Sleep Melatonin • 5 mg, 60 veg capsules
02502 Rest & Renew

VITAMINS
01533 Ascorbyl Palmitate
00920 Benfotiamine with Thiamine
01945 BioActive Complete B-Complex
00102 Biotin
00084 Buffered Vitamin C Powder
02229 Fast-C® and Bio-Quercetin Phytosome
02075 Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
02070 Gamma E Mixed Tocopherol & Tocotrienols
01913 High Potency Optimized Folate
01674 Inositol Caps
02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
01936 Low-Dose Vitamin K2
00373 No Flush Niacin
01939 Optimized Folate (L-Methylfolate)
01217 Pyridoxal 5’-Phosphate Caps
01400 Super Absorbable Tocotrienols
02334 Super K
01863 Super Vitamin E
02422 Vegan Vitamin D3
02028 Vitamin B5 (Pantothenic Acid)
01535 Vitamin B6
00361 Vitamin B12 Methylcobalamin
01536 Vitamin B12 Methylcobalamin
01537 Vitamin B12 Methylcobalamin
02228 Vitamin C and Bio-Quercetin Phytosome
02227 Vitamin C and Bio-Quercetin Phytosome
01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
01758 Vitamin D3 with Sea-Iodine™
02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION
02479 7-Keto® DHEA Metabolite
02207 AMPK Metabolic Activator
02504 Body Trim and Appetite Control
02478 DHEA Complete
01738 Garcinia HCA
02506 Mediterranean Weight Management
01432 Optimized Saffron
00818 Super CLA Blend with Sesame Lignans
02511 Thermo Weight Control
02509 Waistline Control™

WOMEN’S HEALTH
01942 Breast Health Formula
01626 Enhanced Sex for Women 50+
01894 Estrogen for Women
02204 Menopause 731™
02319 Prenatal Advantage
01649 Soy Isoflavones
02513 Women’s Bladder Support
GEROPROTECT® Autophagy Renew™ stimulates the body’s “cellular cleanup” process essential to youthful function.

Artificial Intelligence was one of the tools utilized by researchers to help develop this nutrient blend.

The formula contains luteolin and piperlongumine to:

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

Activating autophagy supports healthy cellular function and longevity.

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

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

*Developed in collaboration with Insilico Medicine, Inc.
With age, synapses that connect our brain cells wither.

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


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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.
TRAGIC ERRORS!
The U.S. Preventive Services Task Force advised against PSA screening in 2008-2012. A 2022 study published in *JAMA* finds a striking increase in metastatic prostate cancers. This happened as physicians stopped utilizing this proven early-detection method.

OMEGA-3 AND MACULAR DEGENERATION
Two meta-analyses find that higher intake of fish oil protects against development and progression of age-related macular degeneration.

REDUCE STRESS...SHARPEN MENTAL FOCUS
Ashwagandha combined with a patented spearmint extract increased mental alertness while restoring calm.

ARTERIAL PLAQUE
In a controlled study, two plant extracts inhibited atherosclerosis and reduced unstable plaque. This led to an 82% reduction in major cardiovascular events.

NAD+ AND HEALTHY LONGEVITY
Found in every living cell, NAD+ levels decline with age. In animal models, restoring NAD+ supports brain, heart, and metabolic health.

SYSTEMIC EFFECTS OF CISTANCHE
Cistanche, a Chinese herb, has been shown in animal studies to have neuroprotective and immune enhancing properties.