



The Science of a Healthier Life®

November/December 2022

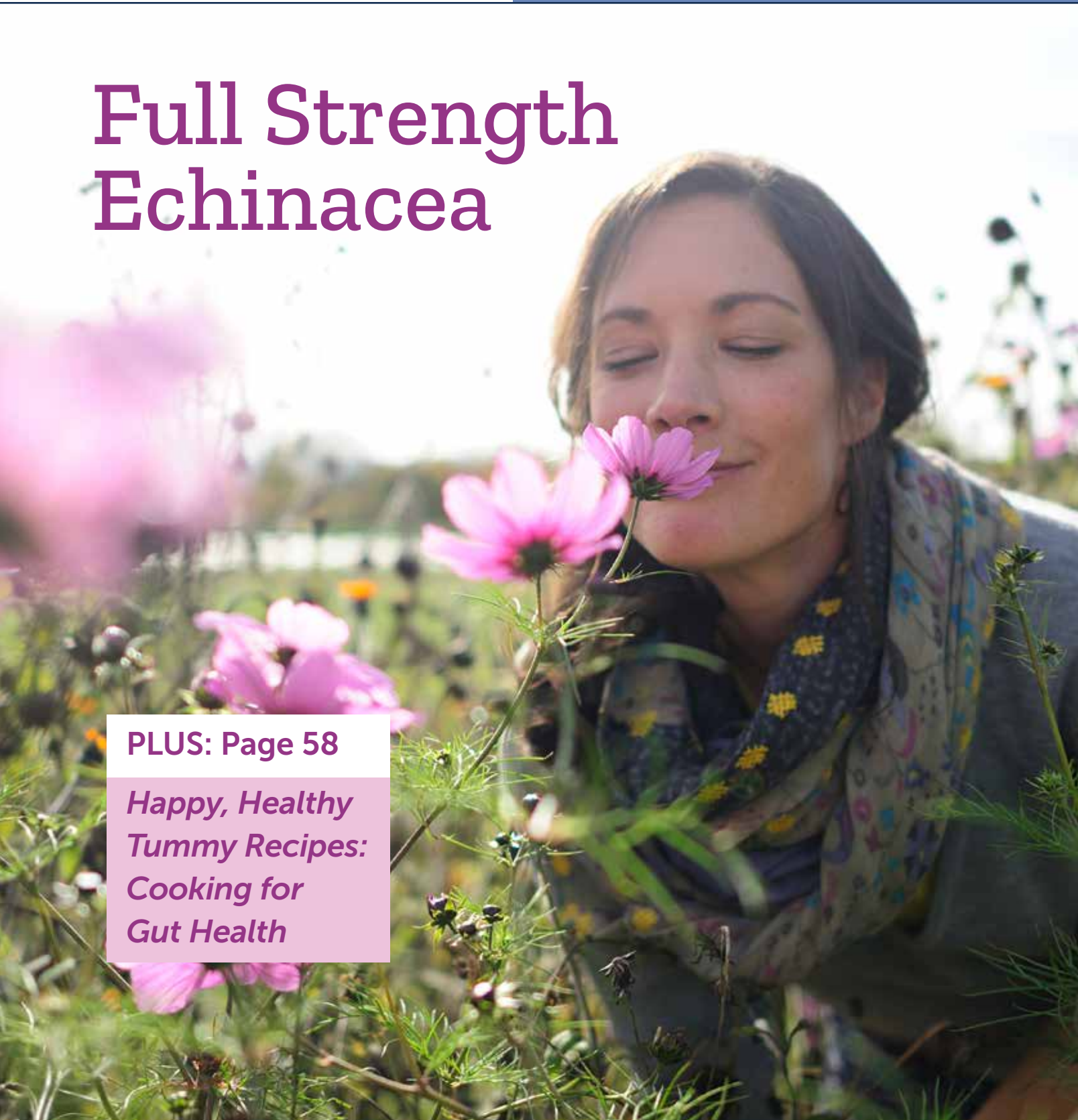
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*Happy, Healthy
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Cooking for
Gut Health*



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Pomegranate plant compounds support **heart** health.



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References

1. *Nutrients*. 2020 Jun; 12(6): 1896.
2. *Mol Nutr Food Res*. 2012 Sep;56(9):1385-97.
3. *Eur J Pharm Sci*. 2003 Jul;19(4):299-304.
4. *Int J Pharm*. 2011 June 30; 412(1-2):99-105.

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*Br J Pharmacol. 2004 Mar;141(5):825-30.

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REPORTS



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To boost the **immune** benefits of **echinacea**, researchers recommend using multiple species and parts of the plant, which are rarely found in commercial supplements.

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The book *Cook for Your Gut Health* provides 60 recipes designed to encourage a healthy microbiome and help prevent chronic GI inflammation. We highlight three flavorful recipes.

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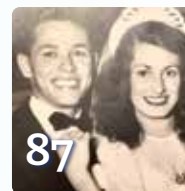
At 95 years old, Marion Ferdinand Hess, Sr., attributes his healthy longevity to the extensive list of supplements that he and his wife started taking for prevention—over 25 years ago.

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Chlorophyllin helps detoxify deadly chemicals that enter the body, while offering protection for cellular DNA.



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Feel better— faster!

Occasional discomfort getting you down? Reach for our Fast Acting Relief formula. This clinically studied combo quickly promotes comfort in muscle tissue, bones, joints, ligaments and beyond.

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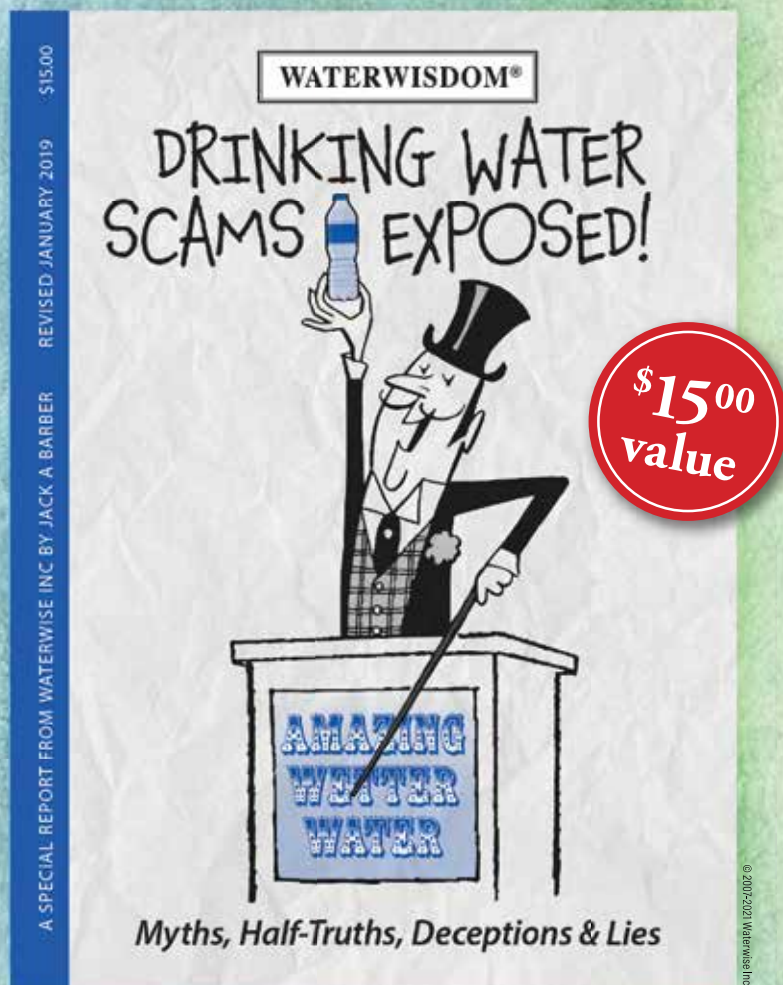
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In the News

Resveratrol Supplementation Improves Glucose Regulation in Type II Diabetics

Supplementing with resveratrol showed positive effects in the regulation of glucose and the maintenance of healthy levels of inflammation and oxidative stress in type II diabetics, according to an article in *Complementary Therapies in Medicine*.*

The participants who completed the trial were being treated with drugs for type II diabetes. One group received **200 mg** of resveratrol daily for 24 weeks and another was given a placebo.

The resveratrol recipients had reductions in glucose and insulin, as well as reduced insulin resistance, compared to the beginning of the trial and to the placebo group.

Editor's Note: The authors concluded that, "Supplementation of resveratrol along with oral hypoglycemic agents may be useful in the reduction of diabetic-associated complications."

* *Complement Ther Med*. 2022 Mar 1;66: 102819.



Vitamin E Helps People with Leukoaraiosis, a Brain Condition

A study published in the *International Journal of Neuroscience* found improvements in factors related to leukoaraiosis, an abnormality in the brain's white matter, among adults given supplements containing vitamin E.*

The study included 160 men and women diagnosed with leukoaraiosis by MRI who had undergone testing for cognitive function. Participants received either **200 IU**, **400 IU** or **600 IU** of vitamin E or a placebo daily for 12 weeks. At the end of the treatment period, blood samples were evaluated for inflammatory factors as well as for markers of oxidative stress and endothelial function.

Inflammation, oxidative stress, and endothelial function improved in all individuals in vitamin E-treated groups compared with the placebo. Cognitive function scores also significantly improved in the vitamin E-treated groups. Improvement in all measured factors was correlated with higher doses of vitamin E.

Editor's Note: "Vitamin E could be a potential drug for the clinical treatment of leukoaraiosis patients," the authors concluded.

* *Int J Neurosci.* 2022 Jun 2;1-9.



Branched Chain Amino Acid Supplements Raise Level of Physical Function in Stroke Patients

Stroke patients who supplemented with branched chain amino acids (BCAAs) showed improvement in muscle and functional status compared to those who did not, the journal *Frontiers in Neurology* reported.*

The study included 54 patients who had recently suffered a stroke and were receiving intensive therapy at a rehabilitation center. Most had muscle tissue loss. Half of the participants received a supplement that contained **6 grams** of a blend of the branched chain amino acids leucine, isoleucine, and valine, twice per day for four weeks.

Among those who received BCAAs, handgrip strength and skeletal muscle mass *improved* after treatment, while in the control group, muscle mass *decreased*.

In the BCAA group, **46%** of the individuals regained the ability to walk by the study's conclusion, compared to **37%** in the placebo group.

Editor's Note: Both groups experienced improvement in physical function such as balance, gait, and swallowing, but the group that received BCAAs improved to a *greater* extent.

* *Front Neurol.* 2022 Mar 11;13:744945.





People with *Higher* Carotenoid Levels Have Lower Dementia Risk

An article published in *Neurology*[®], the medical journal of the American Academy of Neurology, reported an association between higher levels of several carotenoids and a lower risk of developing Alzheimer's disease and other dementias during an average follow-up period of 16 to 17 years.*

Carotenoids are a family of yellow to red plant pigments, including beta-carotene, which have an antioxidant effect.

Researchers examined data from 7,283 men and women who were aged 45 years and older upon enrollment in the third National Health and Nutrition Examination Surveys 1988-1994. Participants' serum levels of antioxidant vitamins A, C and E, and the carotenoids were determined from blood samples collected at the beginning of the study.

Among those aged 65 and older at enrollment, each approximate **15.4 micromols/liter** increase in lutein and zeaxanthin was associated with a **7% decrease** in dementia risk during follow-up. For beta-cryptoxanthin, each **8.6 micromols/liter** increase was associated with a **14%** reduction among those older than 45 at the beginning of the study.

Editor's Note: "Antioxidants may help protect the brain from oxidative stress, which can cause cell damage," stated study author May A. Beydoun, PhD, MPH, of the National Institutes of Health's National Institute on Aging.

* *Neurology*. 2022 May 24;98(21):e2150-e2162.

Vitamin D Levels Linked to Better Cognitive Function in Parkinson's Disease

Higher levels of **vitamin D** are associated with better cognitive function in Parkinson's disease, according to a study published in the *Journal of Clinical Neuroscience*.*

Compared to healthy controls, levels of vitamin D were significantly lower in patients with Parkinson's disease.

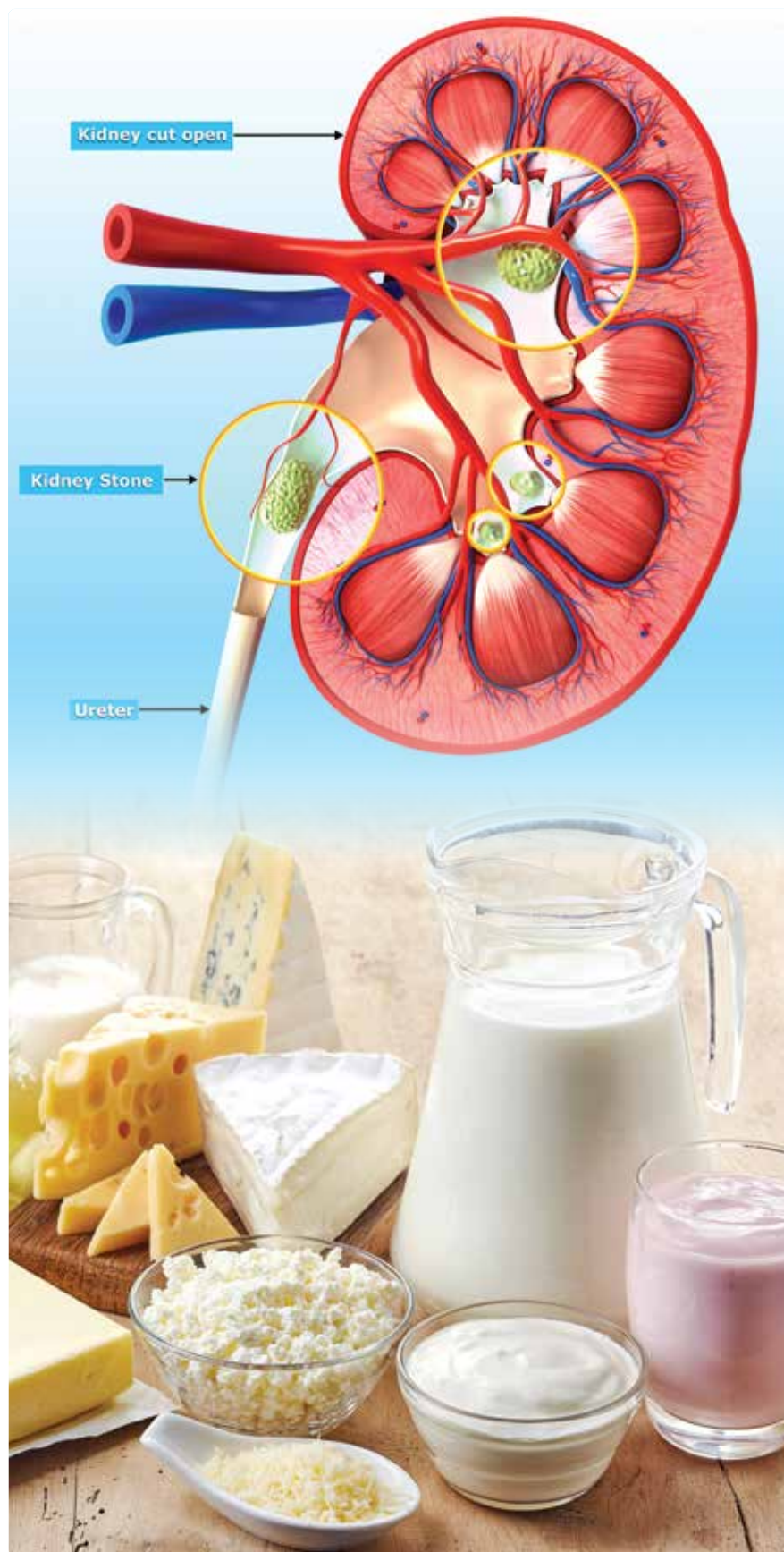
Differences were also noted in the levels of cognitive function within Parkinson's disease patients.

For example, the *highest* levels of vitamin D were seen in those with normal cognition. Those with Parkinson's dementia had the lowest vitamin D levels.

Editor's note: The researchers concluded that, "These findings support the relationship between cognitive impairment and vitamin D in Parkinson's disease patients."

* *Journal of Clinical Neuroscience* 100 (2022) 192-195.





Calcium Intake May Protect Against Kidney Stones' Recurrence

A study reported in *Mayo Clinic Proceedings* revealed a lower risk of recurrent kidney stone symptoms in people who had higher dietary intake of calcium.*

The study enrolled 411 individuals who were symptomatic kidney stone formers and 384 control patients who did not have the condition, following them for a median of 4.1 years. Responses to questionnaires about diet at the beginning of the study were analyzed for the intake of various nutrients.

A recurrence of kidney stone symptoms was experienced by 73 of the stone formers. After adjustment for various factors, lower dietary calcium intake remained a significant predictor of recurrent symptoms.

Editor's Note: *Life Extension* considers an optimal calcium intake of **1,200 mg** from both **diet** and **supplements** together. Many women supplement with **700 mg** of calcium daily.†

† This dose assumes daily calcium dietary intake of **300-500 mg**.

A man may require less supplemental calcium, but aging men need skeletal-support nutrients, like calcium.

* *Mayo Clin Proc.* 2022 Aug;97(8):1437-1448



Cranberry Supplement Boosts Memory

Frontiers in Nutrition reported the finding of a brain benefit among a group of older men and women who consumed a supplement containing powdered cranberries.*

Sixty participants between the ages of 50 to 80 were given a supplement that contained the equivalent of **one cup** of fresh cranberries (providing **281 mg** of proanthocyanidins) or a placebo daily for 12 weeks. Blood chemistry and cognitive function were assessed, and magnetic resonance imaging (MRI) scans of the brain were conducted before and after the treatment period.

Participants who received the supplement showed improved episodic memory performance and neural functioning compared to placebo.

Editor's Note: Additionally, researchers reported the observation that there was a decrease in low-density lipoprotein (LDL) cholesterol during the course of the study. Cranberry juice or concentrated cranberry anthocyanin capsules have long been used to prevent urinary tract infections.

* *Front Nutr.* 2022 May 19;9:849902.

Colorectal Cancer Risk Reduced with Higher Folate Intake

Higher intake of **folate** and its synthetic form, folic acid, is associated with a lower risk of colorectal cancer (CRC), *The American Journal of Clinical Nutrition* reported.*

Based on data collected from more than 85,000 individuals who participated in the Nurses' Health Study, folate intake was assessed using dietary questionnaires, with follow-up lasting from 1980-2016.

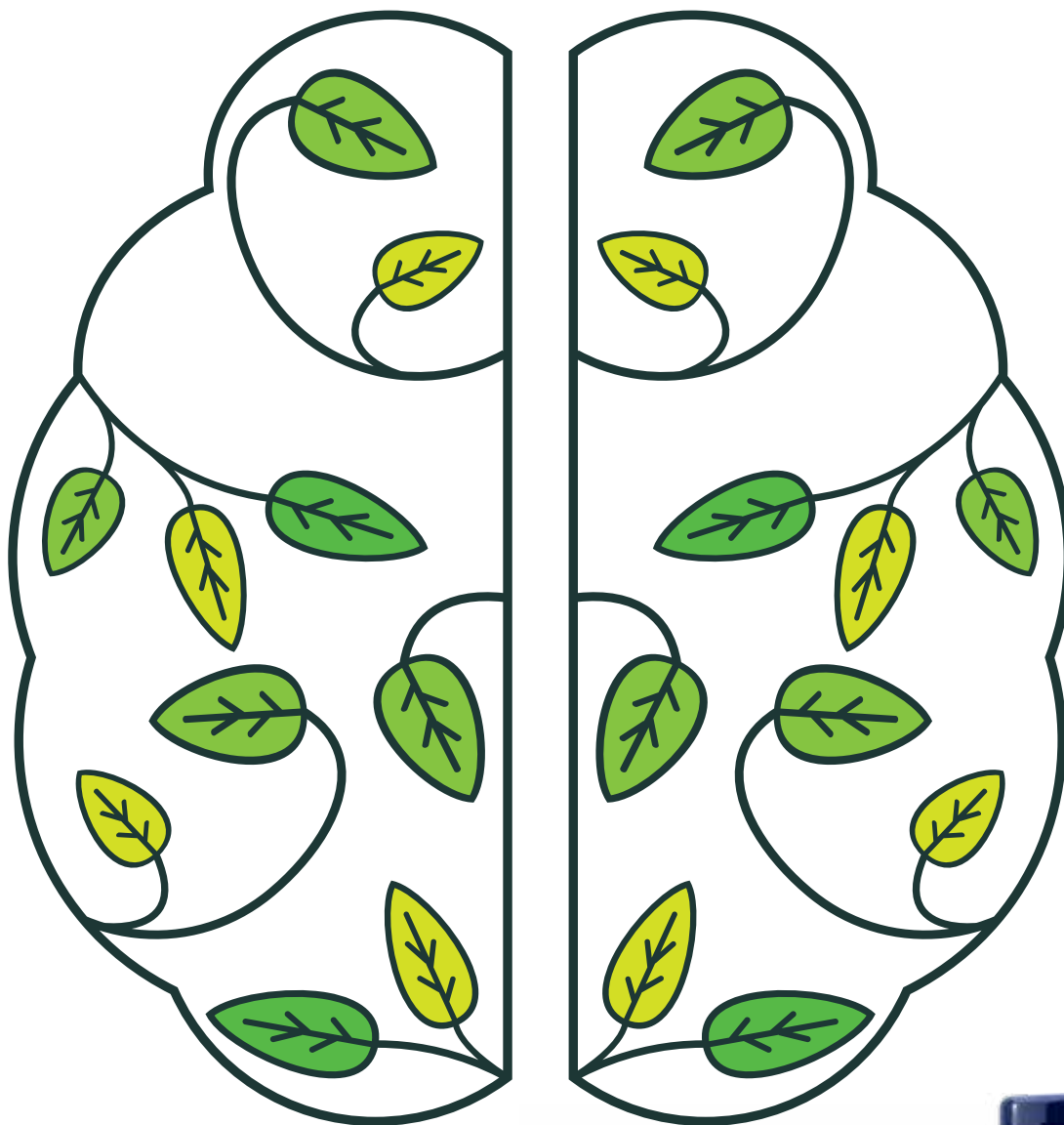
Greater **folate** intake 12-24 years before diagnosis was associated with a **7%-17%** lower risk of colorectal cancer, and greater intake of **folic acid** 16-20 years before diagnosis was associated with a **9%** reduced risk.

Editor's Note: "Folate intake, both total and from synthetic forms, was associated with a lower risk of overall CRC after long latency periods. There was no evidence that high folate intake in the post-fortification period [the 1998 institution of mandatory folic acid fortification in the U.S.] was related to increased CRC risk in this U.S.... population," the authors concluded.

* *Am J Clin Nutr.* 2021 Jul 1;114(1):49-58.



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Vitamin C





NUTRIENTS that IMPACT IMMUNITY

BY MICHAEL DOWNEY

Normal **aging** results in a progressive decline in **immune function** with a sharp fall occurring after age 65-70 years.

Experimental studies seek to restore **stem cells** in bone marrow, where all **immune cells** originate.^{1,2}

The dilemma is that these **stem cell renewal** therapies are not yet available outside research settings.

Healthy immunity at any age, however, can be supported using **nutrients** that function via multiple pathways.

This article summarizes what many readers of this publication are doing to optimize their **immune function**.

Garlic

Garlic

A recent review found that **garlic** compounds show strong **antibacterial** activity against a wide range of harmful bacteria, including drug-resistant strains.³

Another review reported that **garlic** offers **anti-microbial**, antifungal, anticancer, wound-healing, anti-oxidant, anti-inflammatory, and other protective effects.⁴

Compounds in garlic boost proliferation of **T cells** and function of **natural killer** cells.⁵⁻⁸

Garlic's **antiviral** defense was demonstrated when volunteers took **oral garlic** containing the protective garlic compound **allicin** from November through February.⁹

The garlic group suffered **63% fewer cold infections** than the placebo group. Those in the garlic group who *did* catch colds had symptoms for just **1.52 days** on average, compared to **5.01 days** for the placebo group.⁹

Although it contains no allicin, aged garlic extract has demonstrated potent **antiviral** and **immune-enhancing** properties.

In individuals taking an **aged garlic extract**, T cells and NK cells showed greater proliferation, compared to individuals taking placebo. After 90 days, the garlic group had experienced **21%** fewer cold and flu symptoms and **58%** fewer work/school days missed due to illness.⁵



Lactoferrin

Lactoferrin is a protein found in milk and produced in tears, saliva, mucus, and by some **immune cells**.¹⁰

It helps *prevent* a wide range of pathogens from entering through the linings of the oral cavity, nasal cavity, airways, and digestive system. This includes **viruses** that cause the common cold, flu, and hepatitis B and C.¹⁰

Lactoferrin **disrupts viruses' ability to bind to cells**.¹¹ If a virus cannot attach to cells, it cannot cause illness.

Lactoferrin's *indirect* antiviral effects include:

- Activating and increasing **natural killer** cells, which eliminate abnormal cells,^{12,13} and
- Stimulating production of other antiviral compounds, including **interferons**, which trigger immune mechanisms.^{10,14}

If viruses are already *inside* body cells, lactoferrin may block these pathogens from **reproducing**, limiting the spread of an illness and reducing its severity.^{10,15}

Lactoferrin also enhances the immune system's ability to monitor for potential **carcinogenic** cells.¹²

A **2022** study concluded that, by **sequestering iron**, lactoferrin reduces the pathogenic potential of micro-organisms, which *require* iron to grow and reproduce. The study concluded that lactoferrin may help maintain health at **all stages** of life.¹⁶

Vitamin D

Vitamin D fortifies immunity and has anti-microbial effects.¹⁷⁻²¹

Published studies show that vitamin D:

- Interferes with some forms of **viral** replication,
- Helps repair cell linings, including those in the **lung airways**,
- Boosts production of proteins that protect against **infection**, and
- Helps prevent production of excess **pro-inflammatory** compounds in the lungs.

Meta-analyses of clinical trials have shown that vitamin D helps protect against **respiratory tract infections**.^{22,23}

Low vitamin D levels have been associated with *higher* rates of many **chronic diseases**, including cancer.²⁴

In **2022**, two reviews were published documenting vitamin D's capacity to enhance protection against both **infections** and **cancer**.^{25,26}

The first review noted that studies support vitamin D's role in preventing *and* reducing the severity of several **infectious diseases**.²⁵

It also found that *higher* blood 25-hydroxyvitamin D levels (a measure of vitamin D levels in the body) may benefit some **autoimmune rheumatic diseases**.²⁵

The second review found that vitamin D provides **multi-level anti-cancer action** and protects against several **cancer** types.²⁶

Zinc

Zinc deficiency, which is common among the elderly,²⁷ may compromise immune function and contribute to atherosclerosis, **cancer**, autoimmune diseases, and other age-related conditions.^{28,29}

Aging adults who *replenish* zinc levels may slow normal immune decline and protect against **chronic inflammation**.³⁰

Oral zinc intake in the elderly boosts the stress response of **white blood cells**, providing an immune anti-aging mechanism.³¹

A **2022** review study found that zinc's **anti-viral** properties can *disrupt* the **replication** and **infectivity** of some respiratory viruses and help regulate immune response in the respiratory tract.³²

Mushrooms

A **2022** review article concluded that medicinal **mushrooms** possess anticancer, anti-aging, antiviral, anti-parasitic, antimicrobial, and other beneficial properties.³³

Another recent review concluded that mushrooms' ability to inhibit **tumor** cells makes them a "**natural pharmaceutical**."³⁴

Among the most powerful of mushrooms' immune-supporting compounds are **beta glucans**.

They bind to receptors on cells important for **immunity**,^{35,36} boosting their function and helping defend against infection. Beta glucans activate *both* the **innate** (the immediate, general defense) and **adaptive** (a later defense against specific threats) immune responses.^{35,37-40}



Support Immunity as You Age

- The **immune system** weakens with age, increasing risk of infectious disease, cancer, and other life-shortening illnesses.
- Oral intake of **vitamin D, zinc, lactoferrin, mushrooms, garlic, melatonin, and vitamin C** has been shown to enhance immune function.
- Daily use of these nutrients may help fight disease and maintain health well into old age.



Maitake

Chaga

Shiitake

Preclinical studies show that melatonin improves immune response to infection by viruses, bacteria, and parasites by stimulating production and activity of **T cells**, **natural killer** cells, and **macrophages** that engulf and destroy invaders.⁵⁴

Melatonin has also been found to support the immune system's protection against **cancer**, inhibiting it at **every stage**.⁶²⁻⁶⁶

A recent review study concluded that melatonin was a potential **oncostatic**, an agent that blocks cancer spread.⁶⁷ Another **2022** report found that **melatonin** could mitigate cancer's development, growth, and spread.⁶⁸

Vitamin C

In animal models of aging, **beta glucans** help prevent or *reverse* **immunosenescence**.^{39,41}

They boost immune cell numbers *and* improve their function.⁴¹

In **humans**, beta glucans demonstrate **infection-fighting** effects, particularly against upper respiratory tract infections like cold and flu.⁴²

Ragweed **allergy** sufferers also had significant reductions in symptoms and severity after **beta glucans** intake.⁴³

Four mushroom strains that support the immune system are **shiitake**, **maitake**, **reishi**, and **chaga**.^{38,44-52}

Combining **beta glucans** with immune-supporting **mushrooms** may maximize immune support.

Melatonin

With aging, the **thymus gland**—which produces **T cells**—shrinks, diminishing immune function.

But in aged mice, the hormone **melatonin** stimulates *new* thymus growth, producing **new T cells**.⁵³

Melatonin also counters immune decline by:⁵⁴⁻⁶¹

- Enhancing responses of **antibodies** that “tag” viruses, bacteria, and other invaders for destruction by immune system components,
- Improving **T cell activity**, and
- Reducing **chronic inflammation**, a cause of most age-related, chronic disease.

The activity of **phagocytes** (cells that surround and kill invaders), **T cells**, and many other immune cells is closely tied to their **vitamin C** content.⁶⁹

So, it makes sense that **immune functions** are improved by taking **vitamin C**.^{70,71}

A clinical trial showed that oral vitamin C reduced duration of **colds** by **9.4%** on average and may decrease the severity of **respiratory tract infections**.⁷² (Not all studies show vitamin C to be effective against the common cold.)

Researchers have found that vitamin C:

- Boosts function, growth, and survival of **infection-fighting** cells,^{73,74}
- Increases levels of immune-activating **interferons**,^{75,76}
- Neutralizes excess **free radicals** caused by infections, reducing illness severity,⁷⁷
- Promotes production of **collagen**, which maintains a barrier against infection,⁷⁶
- Reduces **histamine**, a pro-inflammatory compound⁷⁶ that plays a role in infections⁷⁸ and causes allergy symptoms,⁷⁹ and
- Lowers **pro-inflammatory** compounds caused by infection, promoting tissue healing.⁸⁰

Optimal immunity requires **daily** intake of vitamin C and other immune-supporting nutrients.

Summary

Age-related **immune system dysfunction** increases risk of infectious disease, cancer, and chronic inflammatory conditions.

Oral intake of the key immune-supporting nutrients **vitamin D, zinc, lactoferrin, mushrooms, garlic, melatonin, and vitamin C** can enhance immune function and partially offset age-related immune decline. •

References

1. Wilkinson AC, Igarashi KJ, Nakauchi H. Haematopoietic stem cell self-renewal in vivo and ex vivo. *Nat Rev Genet.* 2020 Sep;21(9):541-54.
2. Wahlestedt M, Erlandsson E, Kristiansen T, et al. Clonal reversal of ageing-associated stem cell lineage bias via a pluripotent intermediate. *Nat Commun.* 2017 Feb 22;8(1):14533.
3. Bhatwalkar SB, Mondal R, Krishna SBN, et al. Antibacterial Properties of Organosulfur Compounds of Garlic (*Allium sativum*). *Front Microbiol.* 2021 2021-July-27;12:613077.
4. Tesfaye A. Revealing the Therapeutic Uses of Garlic (*Allium sativum*) and Its Potential for Drug Discovery. *ScientificWorldJournal.* 2021 12/30;2021:8817288.
5. Nantz MP, Rowe CA, Muller CE, et al. Supplementation with aged garlic extract improves both NK and gammadelta-T cell function and reduces the severity of cold and flu symptoms: a randomized, double-blind, placebo-controlled nutrition intervention. *Clin Nutr.* 2012 Jun;31(3):337-44.
6. Percival SS. Aged Garlic Extract Modifies Human Immunity. *J Nutr.* 2016 Feb;146(2):433S-6S.
7. Xu C, Mathews AE, Rodrigues C, et al. Aged garlic extract supplementation modifies inflammation and immunity of adults with obesity: A randomized, double-blind, placebo-controlled clinical trial. *Clin Nutr ESPEN.* 2018 Apr;24:148-55.
8. Ishikawa H, Saeki T, Otani T, et al. Aged garlic extract prevents a decline of NK cell number and activity in patients with advanced cancer. *J Nutr.* 2006 Mar;136(3 Suppl):816S-20S.
9. Josling P. Preventing the common cold with a garlic supplement: a double-blind, placebo-controlled survey. *Adv Ther.* 2001 Jul-Aug;18(4):189-93.

10. Wakabayashi H, Oda H, Yamauchi K, et al. Lactoferrin for prevention of common viral infections. *J Infect Chemother.* 2014 Nov;20(11):666-71.
11. Rakowska PD, Tiddia M, Faruqi N, et al. Antiviral surfaces and coatings and their mechanisms of action. *Communications Materials.* 2021 2021/05/28;2(1):53.
12. Zhang Y, Lima CF, Rodrigues LR. Anticancer effects of lactoferrin: underlying mechanisms and future trends in cancer therapy. *Nutr Rev.* 2014 Dec;72(12):763-73.
13. Kuhara T, Yamauchi K, Tamura Y, et al. Oral administration of lactoferrin increases NK cell activity in mice via increased production of IL-18 and type I IFN in the small intestine. *J Interferon Cytokine Res.* 2006 Jul;26(7):489-99.
14. Drago-Serrano ME, Campos-Rodriguez R, Carrero JC, et al. Lactoferrin: Balancing Ups and Downs of Inflammation Due to Microbial Infections. *Int J Mol Sci.* 2017 Mar 1;18(3).
15. Berlutti F, Pantanella F, Natalizi T, et al. Antiviral properties of lactoferrin--a natural immunity molecule. *Molecules.* 2011 Aug 16;16(8):6992-7018.
16. Kowalczyk P, Kaczynska K, Kleczkowska P, et al. The Lactoferrin Phenomenon-A Miracle Molecule. *Molecules.* 2022 May 4;27(9).
17. Dancer RC, Parekh D, Lax S, et al. Vitamin D deficiency contributes directly to the acute respiratory distress syndrome (ARDS). *Thorax.* 2015 Jul;70(7):617-24.
18. Teymoori-Rad M, Shokri F, Salimi V, et al. The interplay between vitamin D and viral infections. *Rev Med Virol.* 2019 Mar;29(2):e2032.
19. Telcian AG, Zdrenghea MT, Edwards MR, et al. Vitamin D increases the antiviral activity of bronchial epithelial cells in vitro. *Antiviral Res.* 2017 Jan;137:93-101.
20. Zdrenghea MT, Makrinioti H, Bagacean C, et al. Vitamin D modulation of innate immune responses to respiratory viral infections. *Rev Med Virol.* 2017 Jan;27(1).
21. Tsujino I, Ushikoshi-Nakayama R, Yamazaki T, et al. Pulmonary activation of vitamin D3 and preventive effect against interstitial pneumonia. *J Clin Biochem Nutr.* 2019 Nov;65(3):245-51.
22. Martineau AR, Jolliffe DA, Hooper RL, et al. Vitamin D supplementation to prevent acute respiratory tract infections: systematic review and meta-analysis of individual participant data. *BMJ.* 2017 Feb 15;356:i6583.
23. Bergman P, Lindh AU, Bjorkhem-Bergman L, et al. Vitamin D and Respiratory Tract Infections: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *PLoS One.* 2013;8(6):e65835.
24. Meehan M, Penckofer S. The Role of Vitamin D in the Aging Adult. *J Aging Gerontol.* 2014 Dec;2(2):60-71.
25. Giannini S, Giusti A, Minisola S, et al. The Immunologic Profile of Vitamin D and Its Role in Different Immune-Mediated Diseases: An Expert Opinion. *Nutrients.* 2022 Jan 21;14(3):473.
26. Munoz A, Grant WB. Vitamin D and Cancer: An Historical Overview of the Epidemiology and Mechanisms. *Nutrients.* 2022 Mar 30;14(7).
27. Barnett JB, Hamer DH, Meydani SN. Low zinc status: a new risk factor for pneumonia in the elderly? *Nutr Rev.* 2010 Jan;68(1):30-7.
28. Chasapis CT, Loutsidou AC, Spiliopoulou CA, et al. Zinc and human health: an update. *Arch Toxicol.* 2012 Apr;86(4):521-34.
29. Haase H, Rink L. The immune system and the impact of zinc during aging. *Immun Ageing.* 2009 Jun 12;6:9.
30. Cabrera AJ. Zinc, aging, and immunosenescence: an overview. *Pathobiol Aging Age Relat Dis.* 2015;5:25592.
31. Putics A, Vodros D, Malavolta M, et al. Zinc supplementation boosts the stress response in the elderly: Hsp70 status is linked to zinc availability in peripheral lymphocytes. *Exp Gerontol.* 2008 May;43(5):452-61.
32. Sadeghsoltani F, Mohammadzadeh I, Safari MM, et al. Zinc and Respiratory Viral Infections: Important Trace Element in Anti-viral Response and Immune Regulation. *Biol Trace Elem Res.* 2022 Jun;200(6):2556-71.
33. Bhambri A, Srivastava M, Mahale VG, et al. Mushrooms as Potential Sources of Active Metabolites and Medicines. *Front Microbiol.* 2022;13:837266.
34. Anusiya G, Gowthama Prabu U, Yamini NV, et al. A review of the therapeutic and biological effects of edible and wild mushrooms. *Bioengineered.* 2021 Dec;12(2):11239-68.



35. Ciecierska A, Drywien ME, Hamulka J, et al. Nutraceutical functions of beta-glucans in human nutrition. *Rocz Panstw Zakl Hig.* 2019;70(4):315-24.
36. Chaplin DD. Overview of the immune response. *J Allergy Clin Immunol.* 2010 Feb;125(2 Suppl 2):S3-23.
37. Jin Y, Li P, Wang F. beta-glucans as potential immunoadjuvants: A review on the adjuvanticity, structure-activity relationship and receptor recognition properties. *Vaccine.* 2018 Aug 23;36(35):5235-44.
38. Dai X, Stanilka JM, Rowe CA, et al. Consuming Lentinula edodes (Shiitake) Mushrooms Daily Improves Human Immunity: A Randomized Dietary Intervention in Healthy Young Adults. *J Am Coll Nutr.* 2015;34(6):478-87.
39. Song L, Yuan J, Ni S, et al. Enhancement of adaptive immune responses of aged mice by dietary intake of beta-glucans, with special emphasis on anti-aging activity. *Mol Immunol.* 2020 Jan;117:160-7.
40. Zheng X, Zou S, Xu H, et al. The linear structure of beta-glucan from baker's yeast and its activation of macrophage-like RAW264.7 cells. *Carbohydr Polym.* 2016 Sep 5;148:61-8.
41. Xu X, Yang J, Ning Z, et al. Lentinula edodes-derived polysaccharide rejuvenates mice in terms of immune responses and gut microbiota. *Food Funct.* 2015 Aug;6(8):2653-63.
42. Zhong K, Liu Z, Lu Y, et al. Effects of yeast beta-glucans for the prevention and treatment of upper respiratory tract infection in healthy subjects: a systematic review and meta-analysis. *Eur J Nutr.* 2021 Dec;60(8):4175-87.
43. Talbott SM, Talbott JA, Talbott TL, et al. beta-Glucan supplementation, allergy symptoms, and quality of life in self-described ragweed allergy sufferers. *Food Sci Nutr.* 2013 Jan;1(1):90-101.
44. Cor D, Knez Z, Knez Hrnica M. Antitumour, Antimicrobial, Antioxidant and Antiacetylcholinesterase Effect of Ganoderma Lucidum Terpenoids and Polysaccharides: A Review. *Molecules.* 2018 Mar 13;23(3).
45. Avtonomova AV, Krasnopol'skaya LM. [Antiviral properties of basidiomycetes metabolites]. *Antibiot Khimioter.* 2014;59(7-8):41-8.
46. Ren G, Xu L, Lu T, et al. Structural characterization and antiviral activity of lentinan from Lentinus edodes mycelia against infectious hematopoietic necrosis virus. *Int J Biol Macromol.* 2018 Aug;115:1202-10.
47. Rincao VP, Yamamoto KA, Ricardo NM, et al. Polysaccharide and extracts from Lentinula edodes: structural features and antiviral activity. *Viral J.* 2012 Feb 15;9:37.
48. Masterson CH, Murphy EJ, Gonzalez H, et al. Purified beta-glucans from the Shiitake mushroom ameliorates antibiotic-resistant Klebsiella pneumoniae-induced pulmonary sepsis. *Lett Appl Microbiol.* 2020 Oct;71(4):405-12.
49. Hou L, Meng M, Chen Y, et al. A water-soluble polysaccharide from Grifola frondosa induced macrophages activation via TLR4-MYD88-IKKbeta-NF-kappaB p65 pathways. *Oncotarget.* 2017 Oct 17;8(49):86604-14.
50. Vetvicka V, Vetvickova J. Immune-enhancing effects of Maitake (Grifola frondosa) and Shiitake (Lentinula edodes) extracts. *Ann Transl Med.* 2014 Feb;2(2):14.
51. Kim YR. Immunomodulatory Activity of the Water Extract from Medicinal Mushroom Inonotus obliquus. *Mycobiology.* 2005 Sep;33(3):158-62.
52. Szychowski KA, Skora B, Pomianek T, et al. Inonotus obliquus - from folk medicine to clinical use. *J Tradit Complement Med.* 2021 Jul;11(4):293-302.
53. Tian YM, Zhang GY, Dai YR. Melatonin rejuvenates degenerated thymus and redresses peripheral immune functions in aged mice. *Immunol Lett.* 2003 Aug 5;88(2):101-4.
54. Carrillo-Vico A, Lardone PJ, Alvarez-Sanchez N, et al. Melatonin: buffering the immune system. *Int J Mol Sci.* 2013 Apr 22;14(4):8638-83.
55. Espino J, Pariente JA, Rodriguez AB. Oxidative stress and immunosenescence: therapeutic effects of melatonin. *Oxid Med Cell Longev.* 2012;2012:670294.
56. Espino J, Bejarano I, Paredes SD, et al. Melatonin is able to delay endoplasmic reticulum stress-induced apoptosis in leukocytes from elderly humans. *Age (Dordr).* 2011 Dec;33(4):497-507.
57. Maestroni GJ. The immunotherapeutic potential of melatonin. *Expert Opin Investig Drugs.* 2001 Mar;10(3):467-76.
58. Sainz RM, Mayo JC, Uria H, et al. The pineal neurohormone melatonin prevents in vivo and in vitro apoptosis in thymocytes. *J Pineal Res.* 1995 Nov;19(4):178-88.
59. Tian YM, Li PP, Jiang XF, et al. Rejuvenation of degenerative thymus by oral melatonin administration and the antagonistic action of melatonin against hydroxyl radical-induced apoptosis of cultured thymocytes in mice. *J Pineal Res.* 2001 Oct;31(3):214-21.
60. Vishwas DK, Mukherjee A, Haldar C, et al. Improvement of oxidative stress and immunity by melatonin: an age dependent study in golden hamster. *Exp Gerontol.* 2013 Feb;48(2):168-82.
61. Akbulut KG, Gonul B, Akbulut H. The effects of melatonin on humoral immune responses of young and aged rats. *Immunol Invest.* 2001 Feb;30(1):17-20.
62. Srinivasan V, Pandi-Perumal SR, Brzezinski A, et al. Melatonin, immune function and cancer. *Recent Pat Endocr Metab Immune Drug Discov.* 2011 May;5(2):109-23.
63. Li Y, Li S, Zhou Y, et al. Melatonin for the prevention and treatment of cancer. *Oncotarget.* 2017 Jun 13;8(24):39896-921.
64. Maroufi NF, Vahedian V, Hemati S, et al. Targeting cancer stem cells by melatonin: Effective therapy for cancer treatment. *Pathol Res Pract.* 2020 May;216(5):152919.
65. Reiter RJ, Rosales-Corral SA, Tan DX, et al. Melatonin, a Full Service Anti-Cancer Agent: Inhibition of Initiation, Progression and Metastasis. *Int J Mol Sci.* 2017 Apr 17;18(4).
66. Talib WH. Melatonin and Cancer Hallmarks. *Molecules.* 2018 Feb 26;23(3).
67. Nikolaev G, Robeva R, Konakchieva R. Membrane Melatonin Receptors Activated Cell Signaling in Physiology and Disease. *Int J Mol Sci.* 2021 Dec 31;23(1).
68. Wang L, Wang C, Choi WS. Use of Melatonin in Cancer Treatment: Where Are We? *Int J Mol Sci.* 2022 Mar 29;23(7).
69. Ströhle A, Wolters M, Hahn A. Micronutrients at the interface between inflammation and infection--ascorbic acid and calciferol: part 1, general overview with a focus on ascorbic acid. *Inflammation & allergy drug targets.* 2011;10 1:54-63.
70. Wintergerst ES, Maggini S, Hornig DH. Immune-enhancing role of vitamin C and zinc and effect on clinical conditions. *Ann Nutr Metab.* 2006;50(2):85-94.
71. Johnston CS, Barkyoub GM, Schumacher SS. Vitamin C supplementation slightly improves physical activity levels and reduces cold incidence in men with marginal vitamin C status: a randomized controlled trial. *Nutrients.* 2014 Jul 9;6(7):2572-83.
72. Hemila H. Vitamin C and Infections. *Nutrients.* 2017 Mar 29;9(4).
73. Huijskens MJ, Walczak M, Koller N, et al. Technical advance: ascorbic acid induces development of double-positive T cells from human hematopoietic stem cells in the absence of stromal cells. *J Leukoc Biol.* 2014 Dec;96(6):1165-75.
74. Huijskens MJ, Walczak M, Sarkar S, et al. Ascorbic acid promotes proliferation of natural killer cell populations in culture systems applicable for natural killer cell therapy. *Cytotherapy.* 2015 May;17(5):613-20.
75. Adrian F, Gombart PD. Immunity In Depth. 2016.
76. Carr AC, Maggini S. Vitamin C and Immune Function. *Nutrients.* 2017 Nov 3;9(11).
77. Iqbal K, Khan A, Khan MMA. Biological Significance of Ascorbic Acid (Vitamin C) in Human Health - A Review. *Pakistan Journal of Nutrition.* 2003 01/01;3(1):5-13.
78. Smuda C, Bryce PJ. New developments in the use of histamine and histamine receptors. *Curr Allergy Asthma Rep.* 2011 Apr;11(2):94-100.
79. Wheatley LM, Togias A. Clinical practice. Allergic rhinitis. *N Engl J Med.* 2015 Jan 29;372(5):456-63.
80. Mohammed BM, Fisher BJ, Kraskauskas D, et al. Vitamin C promotes wound healing through novel pleiotropic mechanisms. *Int Wound J.* 2016 Aug;13(4):572-84.



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References

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



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Item #01713

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VITAMIN D3

Systemic support for immune function, bone health,
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FULL-STRENGTH ECHINACEA

BY MICHAEL DOWNEY

Echinacea is an **immune** enhancing plant.

Clinical studies have shown that compared to placebo, **echinacea** use can lead to an improvement in cold symptoms, **fewer** days with severe symptoms, and **reduction** in cold incidence and severity.¹⁻³

But **not all echinacea is the same**.

Different active components are found in different **species** of echinacea *and* in different **parts** of the plant.

Many echinacea supplements contain only one species, with **80%** of products relying solely on *Echinacea purpurea*.

Not all contain *standardized* ingredients. This results in inconsistent potency.⁴

To maximize echinacea's full immune supportive potential, look for supplements containing **extracts** from various parts of the plant, as well as more than one **plant species**.

This can deliver echinacea's spectrum of immune-boosting benefits.



What is Echinacea?

Echinacea is a plant native to central and eastern North America. It was used as folk medicine by Native Americans to **reduce cold symptoms** and treat coughs, sore throat, and headaches.

When explorers **Lewis** and **Clark** learned about the uses of this medicinal plant in **1805**, they considered it one of their most important finds, mailing its seeds and roots back to President Thomas Jefferson.⁵

Today, echinacea extracts are used to boost **immune function** and treat flu, colds, and other **upper respiratory tract infections**. It is also an anti-inflammatory.

Echinacea's effects derive from its bioactive compounds, including **phenolics**, **polysaccharides**, **alkamides**, **caffeic acid** derivatives, and others.

These active components are found in different parts of the plant (the roots, flowers, leaves, and others) and in different echinacea species. Research suggests that the clinical effects are likely due to these multiple bioactive compounds which may have a synergistic effect.^{6,7}

How Echinacea Works

The compounds in **echinacea** work in different ways to enhance **immune function** and deliver other benefits. For example:⁷

- **Phenolic** compounds provide antiviral, antitumor, and antioxidant activity.
- **Polysaccharides** provide immunomodulating and anti-inflammatory effects. They stimulate **macrophages** (immune cells that destroy harmful microorganisms), which in turn secrete signaling proteins that enhance virus-killing **natural killer (NK)** cells.
- **Alkamides** provide immunomodulating, anti-inflammatory, and antifungal effects, and protect NK cells against compounds that can inhibit their activity.

Boosting Immunity

Preclinical studies support echinacea's use for **immune** support:

- One study found that echinacea produced a **two-fold increase** in natural killer cell **activity** in a type of human immune cell known as **peripheral blood mononuclear cells** (PBMCs).⁸
- In another study on human PBMCs, compared to baseline, echinacea resulted in a **reduction** in **pro-inflammatory** compounds of up to **24%** and a **13% increase** in interleukin 10 (IL-10), an **anti-inflammatory** factor.⁹
- A study on aging mice showed that echinacea increased NK cell **numbers** by **30%** and **activity** by **20%**.¹⁰
- Studies on mice found that echinacea boosted NK cell **activity**¹¹ and that lifelong echinacea use significantly **increased lifespan**.¹²
- A systemic review of preclinical *and* clinical studies found that echinacea may decrease **pro-inflammatory** cytokines and increase levels of **anti-inflammatory** cytokines.¹³

This immune support explains how echinacea may defend against illnesses like the common **cold** and **flu**.

Fighting Upper Respiratory Tract Infections

To evaluate the ability of **echinacea** to help prevent **upper respiratory tract infections**, researchers conducted a meta-analysis of 24 controlled trials, involving a total of **4,631** participants.⁶

These clinical trials had used various echinacea preparations from different species, with dosages ranging anywhere from **40 mg** to **4,000 mg** per day.

The meta-analysis found that echinacea use was associated with an absolute **reduction** of **10%** in the risk of contracting a **cold**, compared to **placebo**.⁶

When the clinical trials included in the study are examined *individually*, the effects of echinacea on the **common cold** are more dramatic.

These individual studies document an array of improvements with **echinacea** use compared to placebo, including:⁶

- **58.7% improvement** in symptoms compared to **33.6%** with placebo,¹
- **33.3% fewer** days with severe symptoms,²
- **36%** relative **reduction** in cold incidence and severity following travel,³ and
- **3.4 days** duration of upper respiratory tract infection, versus **8.6 days** with **placebo**.¹⁴

These human studies used different echinacea **species** and different echinacea plant **parts**, and each trial demonstrated a different type or level of protection against upper respiratory tract infections.

This suggests that using **more than one echinacea species** and **multiple parts of the plant** is the best way to *maximize* echinacea defense.

WHAT
YOU
NEED
TO
KNOW

Getting the Most from Echinacea

- The immune supportive effects of **echinacea** help it defend against upper respiratory tract infections. Clinical studies have shown that compared to placebo, echinacea use can lead to an **improvement** in cold symptoms, **fewer** days with severe symptoms, and **reduction** in cold incidence and severity.
- Different active components are found in different **species** of echinacea and in different **parts** of the plant. Many echinacea products contain only one species and one plant part.
- Studies suggest that to receive echinacea's complete spectrum of immune-boosting and antiviral benefits, it is critical to select a product that contains **extracts** from various parts of the plant, as well as more than one **plant species**.



Summary

Echinacea delivers immune support and varying degrees of protection against colds, flu, and other upper respiratory tract infections.

Different **bioactive compounds** behind this immune support are found in different echinacea *species* and different *parts* of the plant.

Many echinacea supplements contain only one species and provide only one part of the plant. This diminishes the wide range of biologically active components and their immune-supporting effects.

The best way to obtain **echinacea's** full **immune support** and anti-viral power is by taking *extracts* from various parts of the plant, as well as more than one plant species. •

References

1. Brinkeborn RM, Shah DV, Degenring FH. Echinaforce and other Echinacea fresh plant preparations in the treatment of the common cold. A randomized, placebo controlled, double-blind clinical trial. *Phytomedicine*. 1999 Mar;6(1):1-6.
2. Schulten B, Bulitta M, Ballering-Bruhl B, et al. Efficacy of Echinacea purpurea in patients with a common cold. A placebo-controlled, randomised, double-blind clinical trial. *Arzneimittelforschung*. 2001;51(7):563-8.
3. Tiralongo E, Lea RA, Wee SS, et al. Randomised, double blind, placebo-controlled trial of echinacea supplementation in air travellers. *Evid Based Complement Alternat Med*. 2012;2012:417267.
4. Available at: <https://www.consumerlab.com/reviews/echinacea-review/echinacea/>. Accessed August 12, 2022.
5. Kindscher K. The Uses of Echinacea angustifolia and Other Echinacea Species by Native Americans. In: Kindscher K, ed. *Echinacea*. Cham: Springer International Publishing; 2016:9-20.
6. Karsch-Volk M, Barrett B, Kiefer D, et al. Echinacea for preventing and treating the common cold. *Cochrane Database Syst Rev*. 2014 Feb 20;2(2):CD000530.
7. Dalby-Brown L, Barsett H, Landbo AK, et al. Synergistic antioxidative effects of alkamides, caffeic acid derivatives, and polysaccharide fractions from Echinacea purpurea on in vitro oxidation of human low-density lipoproteins. *J Agric Food Chem*. 2005 Nov 30;53(24):9413-23.
8. Gan XH, Zhang L, Heber D, et al. Mechanism of activation of human peripheral blood NK cells at the single cell level by Echinacea water soluble extracts: recruitment of lymphocyte-target conjugates and killer cells and activation of programming for lysis. *Int Immunopharmacol*. 2003 Jun;3(6):811-24.
9. Ritchie MR, Gertsch J, Klein P, et al. Effects of Echinaforce(R) treatment on ex vivo-stimulated blood cells. *Phytomedicine*. 2011 Jul 15;18(10):826-31.
10. Currier NL, Miller SC. Natural killer cells from aging mice treated with extracts from Echinacea purpurea are quantitatively and functionally rejuvenated. *Exp Gerontol*. 2000 Aug;35(5):627-39.
11. Park SJ, Lee M, Kim D, et al. Echinacea purpurea Extract Enhances Natural Killer Cell Activity In Vivo by Upregulating MHC II and Th1-type CD4(+) T Cell Responses. *J Med Food*. 2021 Oct;24(10):1039-49.
12. Brousseau M, Miller SC. Enhancement of natural killer cells and increased survival of aging mice fed daily Echinacea root extract from youth. *Biogerontology*. 2005 2005/05/01;6(3):157-63.
13. Aucoin M, Cardozo V, McLaren MD, et al. A systematic review on the effects of Echinacea supplementation on cytokine levels: Is there a role in COVID-19? *Metabol Open*. 2021 Sep;11:100115.
14. Hall H, Fahlman MM, Engels HJ. Echinacea purpurea and mucosal immunity. *Int J Sports Med*. 2007 Sep;28(9):792-7.



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Donna

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Mitochondrial
Delivery System



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100 mg CoQ10 + 10 mg PQQ

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*Not a low-calorie food. Gummy Science™ Melatonin (item #02503): For occasional sleeplessness.

Gummy Science™ Mediterranean Weight Management (item #02506):

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

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COMPREHENSIVE ECHINACEA SUPPORT

Not All ECHINACEA Is the Same

Echinacea has been used for centuries to support **immune function**.

Most echinacea products contain one part of the plant, extracted from one plant species, limiting the amount of available beneficial compounds.

Echinacea Elite contains **standardized extracts** from *various* parts of the plant, as well as from *more than one* plant **species**. This provides a broad spectrum of echinacea actives for maximum benefits.



Item #02433

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Manage After-Meal Blood Sugar Spikes

BY JASON GREEN



MAQUI BERRIES



CLOVES

It's not just diabetics who have to worry about their **blood glucose** levels.

According to the *National Diabetes Statistics Report*, an estimated **38%** of Americans aged 18 years or older have **blood glucose** levels that are **higher than normal** but not high enough to meet the threshold for **type II diabetes**.¹

Our longstanding position is that anyone with less-than-optimal glucose, insulin and hemoglobin A1c (HbA1c) should aggressively intervene to optimize these glycemic markers.

Scientists have identified two **plant extracts** that can help maintain normal blood sugar levels, particularly **after meals** when spikes typically occur.

In human trials, a **clove extract** and a **maqui berry extract**²⁻⁵ each helped prevent harmful after-meal leaps in blood sugar.

These extracts can aid in maintaining healthy after-meal blood glucose levels.

The Danger of Elevated Blood Sugar

More than **48%** of all U.S. adults aged 65 and over have prediabetes. About **25%** have a formal diagnosis of **type II diabetes**.¹

Those with **prediabetes** may have normal resting levels of glucose, but their levels can get out of control after a meal. These cases often go unnoticed because they're not apparent on standard fasting blood tests.

That's a huge problem. After-meal elevated glucose levels *alone* are associated with higher rates of cardiovascular disease, impaired cognitive function, and death.⁶⁻¹⁴ Almost a **third** of those with prediabetes could go on to develop **diabetes** within **five years** if no corrective actions are taken.¹⁵

Benefits of Plant Extracts

Higher intake of **polyphenols**, health-promoting compounds found in plants, is associated with **protection** from disease. *Low* polyphenol intake is associated with *increased* risk of chronic disease, including **type II diabetes**.⁴

Two specific polyphenol-rich **plant extracts** have been found to have beneficial effects on the control of **glucose** levels, particularly following a meal: **maqui berry extract** and **clove extract**.

Maqui Berry Extract

Maqui berry is a fruit native to South America. Extracts of these berries are high in polyphenols known as **delphinidins**.¹⁶

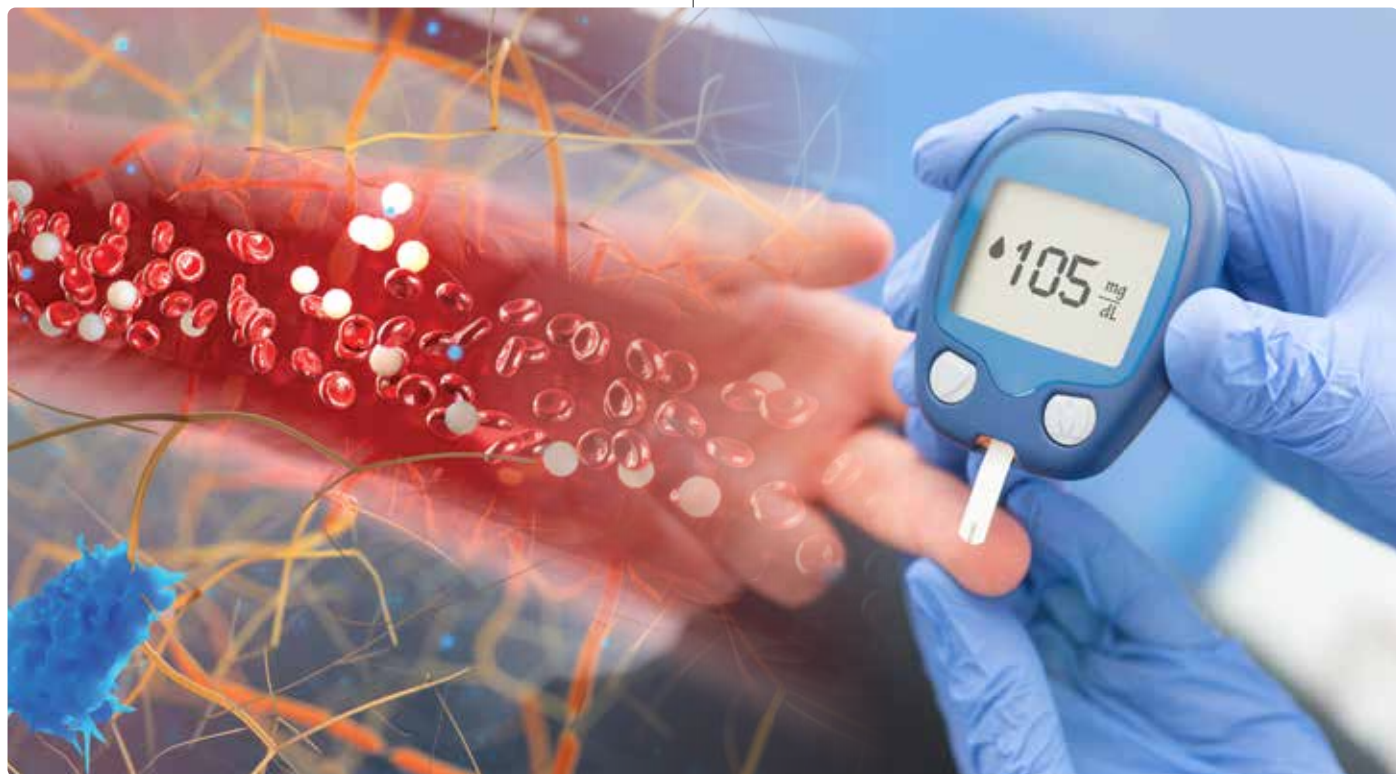
These nutrients have been shown to **lower after-meal glucose levels**. They do this by stimulating a peptide produced in the intestines that improves glucose metabolism.^{16,17}

A study published in **2022** in the medical journal *Frontiers in Nutrition* found that a **single dose** of **maqui berry extract** before intake of sugars was associated with a *decreased* risk of high blood glucose levels in people with **prediabetes**.⁵

Patients showed reductions of the risk of **dysglycemia** (abnormal blood sugar levels) at the different doses tested, with the greatest impact seen with the highest dose of **180 mg**.

In another human study, **200 mg** of maqui berry extract taken before a meal helped lower after-meal **glucose** by more than **15%** while also reducing after-meal **insulin** levels.³ (Excess secretion of insulin is associated with insulin resistance and future diabetic risks.)

Another study of subjects with a *new* diagnosis of **prediabetes**² found that **180 mg** of maqui berry extract significantly *reduced* levels of **HbA1c (hemoglobin A1c)** over 90 days.



WHAT
YOU
NEED
TO
KNOW

After-Meal Glucose Control

- Elevations of **blood sugar** following a meal are associated with poor health outcomes.
- Scientists have found that polyphenol-rich **clove** and **maqui berry** extracts help control blood glucose, reducing after-meal spikes.
- In human studies, **maqui berry extract** reduced high glucose levels after meals in those with prediabetes.
- A **clove extract** lowered after-meal glucose levels in subjects with prediabetes and healthy adults with normal fasting glucose levels. It also reduced **fasting glucose** in prediabetics.

HbA1c is a commonly used blood marker of **long-term** blood glucose control. *Lower* levels indicate *better* long-term glucose control and *less risk* of diseases related to elevated glucose levels.

Overall, these studies suggest that an early intervention with maqui berry extract might help prevent prediabetes from progressing into full-blown **diabetes**.

Clove Extract

Cloves are dried flower buds of the *Syzygium aromaticum* tree. They have been widely used as a spice for centuries.

A **clove extract** has been produced that is standardized to at least **30% total polyphenols**, a powerful mixture of bioactive compounds.¹⁸⁻²⁰



The most compelling evidence of **blood sugar control** using **clove extract** was seen in a clinical trial published in **2019**.⁴ This pilot study enrolled healthy young adults with **normal** fasting glucose levels and prediabetics with **elevated** fasting glucose.

All subjects were given **250 mg of clove extract** daily, following a meal, for 30 days. On various days during this month, subjects had their blood glucose levels tested before and after a meal.

The extract led to improvements in **both groups** as follows:

- Reduced after-meal blood glucose levels by **22%** in those with *normal* fasting glucose, and
- Reduced after-meal blood glucose levels by **27%** in prediabetics with *elevated* fasting glucose.

In the group with **prediabetes**, the clove extract also helped maintain healthy levels of glucose throughout the day. That means their **fasting glucose levels** were also significantly reduced.

Cell culture experiments reveal three ways that clove extract⁴ helps maintain normal blood glucose and prevent after-meal spikes:

- It enhances uptake of glucose into muscle cells by **63%**,
- It inhibits excess production of glucose by liver cells, and
- It reduces the activity of two digestive enzymes that break down more complex sugars such as starch, preventing a spike in glucose.

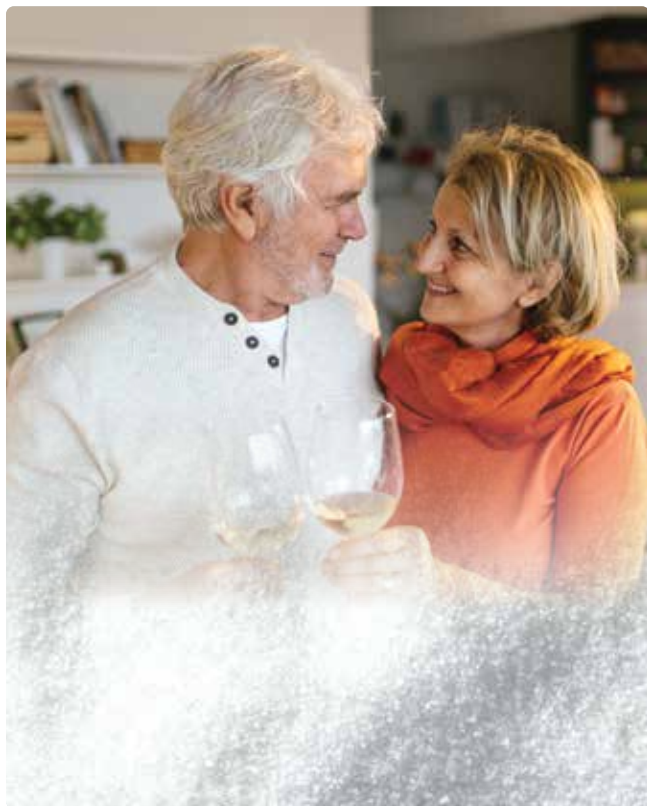
Taking **clove** and **maqui berry extracts** together may reduce after-meal glucose spikes and help with overall glucose control.

Summary

Typical aging people have *higher* than ideal levels of **glucose**, **insulin**, and **A1C**.

Clove extract and **maqui berry extract** have been shown to reduce *after-meal* blood glucose levels in individuals with prediabetes.

Even in adults with *normal* fasting glucose, clove extract reduces after-meal glucose levels. •



References

1. Available at: <https://www.cdc.gov/diabetes/data/statistics-report/index.html>. Accessed August 22, 2022.
2. Alvarado J, Schoenlau F, Leschot A, et al. Delphinol(R) standardized maqui berry extract significantly lowers blood glucose and improves blood lipid profile in prediabetic individuals in three-month clinical trial. *Panminerva Med*. 2016 Sep;58(3 Suppl 1):1-6.
3. Hidalgo J, Flores C, Hidalgo MA, et al. Delphinol(R) standardized maqui berry extract reduces postprandial blood glucose increase in individuals with impaired glucose regulation by novel mechanism of sodium glucose cotransporter inhibition. *Panminerva Med*. 2014 Jun;56(2 Suppl 3):1-7.
4. Mohan R, Jose S, Mulakkal J, et al. Water-soluble polyphenol-rich clove extract lowers pre- and post-prandial blood glucose levels in healthy and prediabetic volunteers: an open label pilot study. *BMC Complement Altern Med*. 2019 May 7;19(1):99.
5. Olivera-Nappa A, Contreras S, Tevy MF, et al. Patient-Wise Methodology to Assess Glycemic Health Status: Applications to Quantify the Efficacy and Physiological Targets of Polyphenols on Glycemic Control. *Front Nutr*. 2022;9:831696.
6. Available at: <https://www.health.ny.gov/diseases/conditions/diabetes/prediabetes/>. Accessed June 22, 2022.
7. Abbatecola AM, Rizzo MR, Barbieri M, et al. Postprandial plasma glucose excursions and cognitive functioning in aged type 2 diabetics. *Neurology*. 2006 Jul 25;67(2):235-40.
8. Barclay AW, Petocz P, McMillan-Price J, et al. Glycemic index, glycemic load, and chronic disease risk—a meta-analysis of observational studies. *Am J Clin Nutr*. 2008 Mar;87(3):627-37.
9. Cavalot F, Petrelli A, Traversa M, et al. Postprandial blood glucose is a stronger predictor of cardiovascular events than fasting blood glucose in type 2 diabetes mellitus, particularly in women: lessons from the San Luigi Gonzaga Diabetes Study. *J Clin Endocrinol Metab*. 2006 Mar;91(3):813-9.
10. Ceriello A. Postprandial hyperglycemia and diabetes complications: is it time to treat? *Diabetes*. 2005 Jan;54(1):1-7.
11. Garcia-Carretero R, Vigil-Medina L, Mora-Jimenez I, et al. Cardiovascular risk assessment in prediabetic patients in a hypertensive population: The role of cystatin C. *Diabetes Metab Syndr*. 2018 Sep;12(5):625-9.
12. Huang Y, Cai X, Mai W, et al. Association between prediabetes and risk of cardiovascular disease and all cause mortality: systematic review and meta-analysis. *BMJ*. 2016 Nov 23;355:i5953.
13. Mijajlovic MD, Aleksic VM, Sternic NM, et al. Role of prediabetes in stroke. *Neuropsychiatr Dis Treat*. 2017;13:259-67.
14. Nathan DM, Davidson MB, DeFronzo RA, et al. Impaired fasting glucose and impaired glucose tolerance: implications for care. *Diabetes Care*. 2007 Mar;30(3):753-9.
15. Available at: <https://www.cdc.gov/diabetes/prevention/about-prediabetes.html>. Accessed August 23, 2022.
16. Alvarado JL, Leschot A, Olivera-Nappa A, et al. Delphinidin-Rich Maqui Berry Extract (Delphinol(R)) Lowers Fasting and Postprandial Glycemia and Insulinemia in Prediabetic Individuals during Oral Glucose Tolerance Tests. *Biomed Res Int*. 2016;2016:9070537.
17. Kato M, Tani T, Terahara N, et al. The Anthocyanin Delphinidin 3-Rutinoside Stimulates Glucagon-Like Peptide-1 Secretion in Murine GLUTag Cell Line via the Ca²⁺/Calmodulin-Dependent Kinase II Pathway. *PLoS One*. 2015;10(5):e0126157.
18. Issac A, Gopakumar G, Kuttan R, et al. Safety and anti-ulcerogenic activity of a novel polyphenol-rich extract of clove buds (*Syzygium aromaticum* L.). *Food Funct*. 2015 Mar;6(3):842-52.
19. Nm J, Rm R, G G, et al. Beyond the flavour: a de-flavoured polyphenol rich extract of clove buds (*Syzygium aromaticum* L.) as a novel dietary antioxidant ingredient. *Food Funct*. 2015 Oct;6(10):3373-82.
20. Jose S, Ratheesh M, Asha I, et al. Hepatoprotective effect of clove bud polyphenols (*Syzygium aromaticum* L.) (Clovino[®]) by modulating alcohol induced oxidative stress and inflammation. *Journal of Food Research*. 2018;7(1):10-20.

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

Mary

VERIFIED CUSTOMER REVIEW



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

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Autophagy

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

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There's Nothing Sweet

About Crashing
After You Eat



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"This product has been useful along with diet in keeping better blood sugar control."

Myra

VERIFIED CUSTOMER REVIEW



Suggested dose is one capsule a day or as recommended by a healthcare practitioner.

If you are taking blood glucose lowering medication, consult your healthcare provider before taking this product.

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The Problem with Sleep-Aid Drugs

BY BARRY MICHAELS

More than **30 million** adults in the U.S. rely on **Xanax[®], Valium[®], Ativan[®]**, or other prescription **benzodiazepine** drugs to cope with sleep disorders.¹⁻³

These drugs come with side effects, and long-term use can lead to addiction.

Benzodiazepines cause another issue. Their use is associated with reduced **melatonin** levels.⁴⁻⁶

In one study, a *single* dose of a benzodiazepine derivative (which is metabolized into active benzodiazepines) before bedtime significantly ***suppressed the production of melatonin.***⁴

Melatonin helps regulate our **sleep cycles**. This means that benzodiazepines *interfere* with the body's natural ability to initiate healthy sleep.

Clinical trials show that melatonin intake can **improve sleep** quality in many people and appears to help reduce dependence on benzodiazepine **drugs**.

Dangers of Benzodiazepines

More than **50 million** U.S. adults suffer from a **sleep disorder** like insomnia or sleep apnea.^{7,8}

Poor sleep has been linked with health problems, including type II diabetes, obesity, and injuries. In the elderly, sleep problems are associated with increased risk of falls, frailty, and death.⁹⁻¹⁴

Many people turn to **benzodiazepine** drugs for help.¹⁵ These drugs enhance sleep onset, reduce the number of times waking at night, and improve total sleep time and sleep quality with **short-term** use.¹⁶ Too often, these drugs are taken *longer* than needed, increasing their addictive potential.

Well-known downsides to regular benzodiazepine use:¹⁷⁻¹⁹

- They are heavily **sedating**, impairing the ability to think clearly and increasing risk for accidents.
- They can lead to **tolerance**, which means users need to take higher and higher doses to get the same effect.
- They can lead to **dependence** or **addiction**.
- They come with common **side effects** including dizziness, weakness, depression, and confusion.



What's less well-known is that benzodiazepines **interfere** with how the **brain** naturally promotes healthy sleep.

Benzodiazepines Deplete Melatonin

Melatonin is a hormone secreted by the brain's **pineal gland**. Often called the "sleep hormone," it is central to regulating the body's natural **sleep-wake cycle**.²⁰

Benzodiazepines **interfere** with the body's natural melatonin production.⁴

As early as 1986, scientists found that even a *single* dose of a benzodiazepine derivative (which is metabolized into active benzodiazepines) before bedtime significantly **suppresses the production of melatonin**.⁴ When scientists administered a drug that *blocked* the action of benzodiazepines, melatonin was restored to normal levels.

Larger studies have confirmed this finding. For example, after a single nighttime dose of **alprazolam (Xanax®)**, peak levels of melatonin in the bloodstream are roughly **half** what they would be normally.^{5,6}

By trying to improve sleep quality with benzodiazepines, people are impeding their body's natural ability to regulate sleep.

How Oral Melatonin Improves Sleep

A meta-analysis of **19** studies found that melatonin **improves sleep** in multiple ways, including:²¹

- Reducing the time it takes to *fall asleep*,
- Improving sleep *quality*, and
- Extending the *duration* of sleep.

Melatonin promotes **relaxation** and **sleep**, without side effects or the risk of dependence associated with benzodiazepines.

For example, an observational study of patients undergoing kidney dialysis—which is often associated with sleep disturbances—found that taking **3 mg of melatonin** before bedtime was *more effective* than **Xanax®** in improving sleep quality as shown in multiple subjective sleep assessment scales.²²

Regrettably, not all sleep-deprived sufferers find complete relief using melatonin alone.

Reduce Dependence on Drugs

Melatonin is **safer** than benzodiazepines and has side benefits that include potential to reduce risks of certain **cancers**.²³

It is not addictive or sedating, and melatonin *supports* the brain's natural ability to promote sleep instead of interfering with it.

In elderly insomniacs who use benzodiazepines to be able to sleep, adding **melatonin** significantly improved **sleep quality** and **time**.²⁴ In a follow-up study, scientists evaluated whether taking melatonin could help people *stop* using benzodiazepines.²⁵

They randomized elderly insomniacs on benzodiazepines to receive either **2 mg** of controlled-release **melatonin** before bed or a **placebo**. During the six weeks of the study, participants were encouraged to try to wean themselves off benzodiazepines.

By the end of the study, **79%** of those taking melatonin were able to **completely discontinue benzodiazepine use**. In the placebo group, only **25%** were able to stop using benzodiazepines.

Life Extension advises not to discontinue any medication without prior approval from your treating physician.

Summary

The use of **benzodiazepines** to promote sleep comes with potential side effects and may lead to dependence.

Clinical trials show that melatonin **improves sleep** quality, helps people fall asleep faster, helps them stay asleep longer, and can help **benzodiazepine** users discontinue their use of these drugs.

The dilemma is that melatonin does not work for everyone and better methods to improve sleep quality, especially in older individuals, is urgently needed.

Please consult with your treating physician before discontinuing use of any medication. •



Melatonin Compared to Prescription Sleep Medications

- Many people turn to **benzodiazepine** drugs to help promote sleep. But benzodiazepines cause sedation and are often addictive.
- Research has revealed that even a *single* dose of a benzodiazepine significantly lowers levels of **melatonin**, the sleep hormone that is integral to sleep control in the body.
- Trials show that **oral melatonin** promotes sleep without side effects or the risk for dependence associated with benzodiazepines.



Common Benzodiazepines

The **benzodiazepines**, often referred to as “benzos,” are a group of drugs that induce sedation and sleep.

Below is a list of the most commonly used benzodiazepines:²⁶

Alprazolam (Xanax®)
 Diazepam (Valium®)
 Lorazepam (Ativan®)
 Clonazepam (Klonopin®)
 Chlordiazepoxide (Librium®)
 Temazepam (Restoril®)
 Clorazepate (Tranxene®)
 Halazepam (Paxipam®)
 Estazolam (ProSom®)
 Flurazepam (Dalmane®)
 Triazolam (Halcion®)
 Oxazepam (Serax®)
 Prazepam (Centrax®)
 Quazepam (Doral®)

References

1. Available at: <https://www.psychiatryadvisor.com/home/topics/sleep-wake-disorders/prevalence-of-benzodiazepine-use-misuse-among-us-adults-analyzed/>. Accessed July 18, 2022.
2. Available at: <https://www.psychiatryadvisor.com/home/topics/anxiety/prevalence-of-benzodiazepine-use-12-6-percent-in-the-united-states/>. Accessed July 18, 2022.
3. Debra Fulghum Bruce P. Prescription Drug Abuse. 2022.
4. Kabuto M, Namura I, Saitoh Y. Nocturnal enhancement of plasma melatonin could be suppressed by benzodiazepines in humans. *Endocrinol Jpn*. 1986 Jun;33(3):405-14.
5. McIntyre IM, Burrows GD, Norman TR. Suppression of plasma melatonin by a single dose of the benzodiazepine alprazolam in humans. *Biol Psychiatry*. 1988 May;24(1):108-12.
6. McIntyre IM, Norman TR, Burrows GD, et al. Alterations to plasma melatonin and cortisol after evening alprazolam administration in humans. *Chronobiol Int*. 1993 Jun;10(3):205-13.
7. Patel D, Steinberg J, Patel P. Insomnia in the Elderly: A Review. *J Clin Sleep Med*. 2018 Jun 15;14(6):1017-24.
8. ASA. Sleep and Sleep Disorder Statistics. *AMERICAN SLEEP ASSOCIATION*. 2022.
9. Cedernaes J, Schiøth HB, Benedict C. Determinants of shortened, disrupted, and mistimed sleep and associated metabolic health consequences in healthy humans. *Diabetes*. 2015 Apr;64(4):1073-80.
10. Ensrud KE, Blackwell TL, Ancoli-Israel S, et al. Sleep disturbances and risk of frailty and mortality in older men. *Sleep Med*. 2012 Dec;13(10):1217-25.
11. Kessler RC, Berglund PA, Coulouvrat C, et al. Insomnia, comorbidity, and risk of injury among insured Americans: results from the America Insomnia Survey. *Sleep*. 2012 Jun 1;35(6):825-34.
12. Landry GJ, Liu-Ambrose T. Buying time: a rationale for examining the use of circadian rhythm and sleep interventions to delay progression of mild cognitive impairment to Alzheimer's disease. *Front Aging Neurosci*. 2014;6:325.
13. Stone KL, Blackwell TL, Ancoli-Israel S, et al. Sleep disturbances and risk of falls in older community-dwelling men: the outcomes of Sleep Disorders in Older Men (MrOS Sleep) Study. *J Am Geriatr Soc*. 2014 Feb;62(2):299-305.
14. Cooper CB, Neufeld EV, Dolezal BA, et al. Sleep deprivation and obesity in adults: a brief narrative review. *BMJ Open Sport Exerc Med*. 2018;4(1):e000392.
15. Maust DT, Lin LA, Blow FC. Benzodiazepine Use and Misuse Among Adults in the United States. *Psychiatr Serv*. 2019 Feb 1;70(2):97-106.
16. Edinoff AN, Nix CA, Hollier J, et al. Benzodiazepines: Uses, Dangers, and Clinical Considerations. *Neurol Int*. 2021 Nov 10;13(4):594-607.
17. Votaw VR, Geyer R, Rieselbach MM, et al. The epidemiology of benzodiazepine misuse: A systematic review. *Drug Alcohol Depend*. 2019 Jul 1;200:95-114.
18. Available at: <https://www.rxlist.com/benzodiazepines/drug-class.htm>. Accessed July 13, 2022.
19. Available at: <https://www.medicalnewstoday.com/articles/262809>. Accessed July 13, 2022.
20. Masters A, Pandi-Perumal SR, Seixas A, et al. Melatonin, the Hormone of Darkness: From Sleep Promotion to Ebola Treatment. *Brain Disord Ther*. 2014;4(1).
21. Ferracioli-Oda E, Qawasmi A, Bloch MH. Meta-analysis: melatonin for the treatment of primary sleep disorders. *PLoS One*. 2013;8(5):e63773.
22. Asghar MS, Ahsan MN, Jawed R, et al. A Comparative Study on the Use of Alprazolam and Melatonin for Sleep Disturbances in Hemodialysis Patients. *Cureus*. 2020 Nov 28;12(11):e11754.
23. Available at: <https://www.lifeextension.com/magazine/2022/7/higher-dose-melatonin>. Accessed 2022, July 19.
24. Garfinkel D, Laudon M, Zisapel N. Improvement of sleep quality by controlled-release melatonin in benzodiazepine-treated elderly insomniacs. *Arch Gerontol Geriatr*. 1997 Mar-Apr;24(2):223-31.
25. Garfinkel D, Zisapel N, Wainstein J, et al. Facilitation of benzodiazepine discontinuation by melatonin: a new clinical approach. *Arch Intern Med*. 1999 Nov 8;159(20):2456-60.
26. Available at: https://www.dea.gov/sites/default/files/2020-06/Benzodiazepenes-2020_1.pdf. Accessed July 13, 2022.



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Bloated? Get Relief

BY LAURIE MATHENA

Sometimes, the foods you love *don't love you back*.

Between **16% to 31%** of adults complain of **bloating**, which produces uncomfortable feelings of excessive fullness, gas, abdominal pressure, and pain. A whopping **66% to 90%** of those with irritable bowel syndrome (IBS) suffer from the same symptoms.¹

Bloating also often goes hand-in-hand with other gastrointestinal disorders, such as **dyspepsia** (indigestion), celiac disease, and constipation.¹

Fortunately, **four plant compounds** have been shown to provide effective relief from occasional digestive discomfort.

Decreased Bloating

Fennel and **curcumin** have traditionally been used to aid digestion.

In a clinical trial, researchers combined **fennel seed oil** and **low-dose curcumin** to test their effect in patients with **irritable bowel syndrome**.²



After 30 days, those taking the **fennel-curcumin** blend reported an average **50%** decrease in a rating score of bloating, abdominal pain, and other irritable bowel syndrome symptoms. This was nearly *double* the **26.1%** decrease in the placebo group.

Even better, **all symptoms** were improved by treatment with fennel and curcumin, and **25.9%** of the **fennel-curcumin** group became **completely symptom-free** (compared to just **6.8%** of placebo recipients).

The treated group also reported a significant improvement in irritable bowel syndrome-related quality of life, with no adverse effects.

Improved Digestive Symptoms

Two additional extracts, **artichoke** and **ginger**, have been shown to substantially improve **digestive symptoms** like bloating, nausea, vomiting, upper abdominal pain, and feeling overly full after eating only a small amount of food.

In a clinical trial, 126 patients with **functional dyspepsia** (recurring and unexplained indigestion) received either **20 mg** of ginger root extract and **100 mg** of artichoke leaf extract or a placebo.³

In just two weeks, **44.6%** of participants taking the artichoke-ginger blend had **significant improvement** in digestive symptoms, compared to **13.1%** of placebo recipients.

After **four weeks**, **63.1%** of those in the treatment group reported **marked reductions** in digestive symptoms, compared to only **24.6%** in the placebo group.

Summary

After-meal **bloating** and other gastrointestinal disturbances can impair our quality of life.

Ginger, artichoke leaf, fennel, and curcumin have shown clinical effectiveness in decreasing bloating, gas, nausea, abdominal pain, and other symptoms typical of irritable bowel syndrome as well as other gastrointestinal problems.

Together, extracts from these four plants may promote a healthier digestive system. •

References

1. Lacy BE, Cangemi D, Vazquez-Roque M. Management of Chronic Abdominal Distension and Bloating. *Clin Gastroenterol Hepatol*. 2021 Feb;19(2):219-31 e1.
2. Portincasa P, Bonfrate L, Scribano ML, et al. Curcumin and Fennel Essential Oil Improve Symptoms and Quality of Life in Patients with Irritable Bowel Syndrome. *J Gastrointest Liver Dis*. 2016 Jun;25(2):151-7.
3. Giacosa A, Guido D, Grassi M, et al. The Effect of Ginger (*Zingiber officinalis*) and Artichoke (*Cynara cardunculus*) Extract Supplementation on Functional Dyspepsia: A Randomised, Double-Blind, and Placebo-Controlled Clinical Trial. *Evid Based Complement Alternat Med*. 2015;2015:915087.





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Cook for Your Gut Health:

Quiet Your Gut, Boost Fiber, and Reduce Inflammation



Gut health is vital to your overall health and longevity. Beyond influencing your digestive system, it plays a role in immunity, emotions, and in how well you absorb nutrients from food.

The cookbook, *Cook for Your Gut Health*, from America's Test Kitchen, provides recipes designed to encourage a healthy microbiome.

These recipes are packed with fiber to help keep you regular, provide prebiotics that help feed the good bacteria in your gut, and help prevent chronic inflammation in your GI tract.

All the recipes can be adjusted to be gluten-free, lactose-free, or wheat-free. And 60 of the recipes in *Cook for Your Gut Health* are naturally low FODMAP, while others can be easily customized to be low FODMAP.

FODMAPs are fermentable carbohydrates that are notorious for triggering digestive symptoms like pain, gas, and bloating. A low-FODMAP diet is recommended for anyone suffering from irritable bowel syndrome (IBS) and other digestive disorders.

In addition to its gut-friendly recipes, *Cook for Your Gut Health* provides an in-depth education on the science of gut health, how to eat to support a healthy gut, and information on the low-FODMAP diet.

The following recipes from the book prove that you don't have to sacrifice flavor or variety to support a healthy gut.

—LAURIE MATHENA

Pea and Feta Frittata

SERVES 4

- 12 large eggs
- $\frac{1}{3}$ cup whole milk
- $\frac{1}{2}$ teaspoon plus pinch table salt, divided
- 2 ounces feta cheese, crumbled into $\frac{1}{2}$ -inch pieces ($\frac{1}{2}$ cup)
- 2 tablespoons minced fresh oregano
- 2 tablespoons extra-virgin olive oil, divided
- 2 cups frozen peas
- Pinch red pepper flakes (optional)
- $\frac{1}{2}$ teaspoon grated lemon zest plus $2\frac{1}{2}$ teaspoons juice, divided
- 6 ounces (6 cups) baby arugula
- 1 fennel bulb, stalks discarded, bulb halved, cored, and sliced thin

1. Adjust oven rack to middle position and heat oven to 350 degrees. Whisk eggs, milk, and $\frac{1}{2}$ teaspoon salt in bowl until well combined. Stir in feta and oregano.

2. Heat 1 teaspoon oil in 12-inch oven-safe nonstick skillet over medium-high heat until shimmering. Add peas, pepper flakes, and $\frac{1}{4}$ cup water. Cover and cook until peas are bright green and just tender, 3 to 5 minutes. Uncover, stir in lemon zest and $\frac{1}{2}$ teaspoon juice and cook until skillet is dry, about 1 minute.

3. Add egg mixture and cook, using rubber spatula to stir and scrape bottom of skillet until large curds form and spatula leaves trail through eggs but eggs are still very wet,

about 30 seconds. Smooth curds into even layer and cook, without stirring, for 30 seconds. Transfer skillet to oven and bake until frittata is slightly puffy and surface bounces back when lightly pressed, 6 to 9 minutes.

4. Using rubber spatula, loosen frittata from skillet and transfer to cutting board. Let sit for 5 minutes. Meanwhile, whisk remaining 5 teaspoons oil, remaining 2 teaspoons lemon juice, and remaining pinch salt together in large bowl.

Add arugula and fennel and toss to coat. Season with salt and pepper to taste. Serve.

Make it Low FODMAP Substitute dairy-free or lactose-free milk for whole milk. Substitute 2 cups frozen broccoli florets, thawed and chopped, for peas. Increase arugula to 8 ounces and reduce fennel to $\frac{1}{2}$ bulb.

Make it Dairy Free Substitute dairy-free milk for the whole milk. Omit feta.



Salmon, Avocado, Orange, and Watercress Salad

SERVES 4

2 (6- to 8-ounce) skin-on salmon fillets, 1 inch thick

3 tablespoons plus 1 teaspoon extra-virgin olive oil, divided

$\frac{3}{4}$ teaspoon table salt, divided

$\frac{1}{2}$ teaspoon pepper

3 oranges

1 teaspoon white wine vinegar

1 teaspoon Dijon mustard

4 ounces (4 cups) watercress, torn into bite-size pieces

1 avocado, halved, pitted, and sliced thin

$\frac{1}{4}$ cup fresh mint leaves, torn

$\frac{1}{4}$ cup hazelnuts, toasted and chopped

1. Adjust oven rack to lowest position, place aluminum foil-lined rimmed baking sheet on rack, and heat oven to 500 degrees. Make 4 or 5 shallow slashes, about 1 inch apart, on skin side of each fillet, being careful not to cut into flesh. Pat salmon dry with paper towels, rub with 1 teaspoon oil, and sprinkle with $\frac{1}{4}$ teaspoon salt and pepper.

2. Reduce oven temperature to 275 degrees and remove sheet from oven. Carefully place salmon skin side down on hot sheet. Roast until center is still translucent when checked with tip of paring knife and registers 125 degrees (for medium-rare), 8 to 12 minutes. Transfer

salmon to plate. Let cool completely, about 20 minutes. Using 2 forks, flake salmon into rough 2-inch pieces; discard skin.

3. Meanwhile, cut away peel and pith from oranges. Holding fruit over bowl, use paring knife to slice between membranes to release segments. Measure out 2 tablespoons orange juice and transfer to separate bowl.

4. Add vinegar, mustard, remaining 3 tablespoons oil, and remaining $\frac{1}{2}$ teaspoon salt to bowl with orange juice and whisk until smooth.

Arrange watercress in even layer on serving platter. Top with salmon pieces, orange segments, and avocado. Drizzle vinaigrette over top, then sprinkle with mint and hazelnuts. Serve.

Make it Low FODMAP Reduce avocado to $\frac{1}{2}$ avocado (4 ounces).



Pan-Seared Chicken Breasts with Artichoke, Tomato, and Bulgur Pilaf

SERVES 4

- ½ teaspoon ground cumin
- ¼ teaspoon plus ⅛ teaspoon table salt, divided
- ⅛ teaspoon pepper
- 4 (6-ounce) boneless, skinless chicken breasts, trimmed
- ¼ cup extra-virgin olive oil, divided
- 1½ cups jarred whole baby artichokes packed in water, rinsed, patted dry, and quartered
- 2¼ cups water
- 1½ cups medium-grind bulgur
- 10 ounces cherry tomatoes, halved
- 3 ounces feta cheese, crumbled (¾ cup)
- ¾ cup minced fresh parsley
- ⅓ cup pitted kalamata olives, chopped
- 1 tablespoon lemon juice

1. Combine cumin, ¼ teaspoon salt, and pepper in bowl. Cover chicken breasts with plastic wrap and pound to uniform thickness as needed. Pat dry with paper towels and sprinkle with cumin mixture.

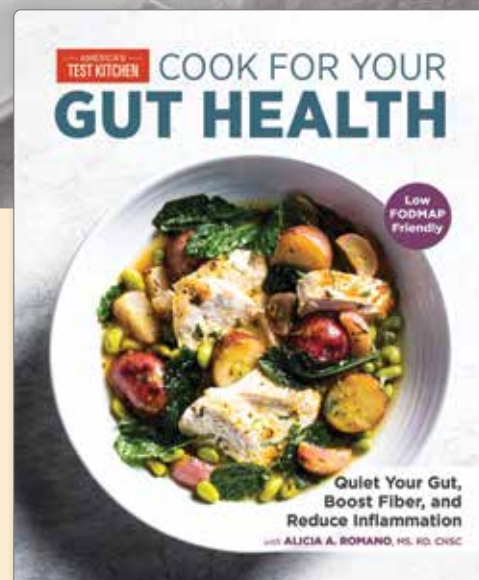
2. Heat 1 tablespoon oil in 12-inch skillet over medium-high heat until just smoking. Cook breasts, turning as needed, until golden brown and register 160 degrees, about 10 minutes. Transfer breasts to plate, tent with aluminum foil, and let rest while preparing pilaf.



3. Heat 1 tablespoon oil in now-empty skillet over medium-high heat until shimmering. Add artichoke hearts and cook, without stirring, until spotty brown, about 2 minutes. Stir in water, scraping up any browned bits, and bring to boil. Stir in bulgur and remaining ⅛ teaspoon salt. Off heat, cover and let sit until grains are softened and liquid is fully absorbed, about 5 minutes.

4. Add tomatoes, feta, parsley, olives, lemon juice, and remaining 2 tablespoons oil to pilaf and gently fluff with fork to combine. Season with pepper to taste. Serve chicken with pilaf.

Make It Dairy Free Omit feta.



To order a copy of *Cook for Your Gut Health*, call 1-800-544-4440 or visit www.LifeExtension.com

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DIGESTIVE UPSETS?



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Bloating**

Bloat Relief helps relieve occasional discomfort, such as gas and **bloating** following a meal.

Scientists have combined four **plant extracts** that target **underlying causes** of gastrointestinal discomforts:

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- **Artichoke leaf**
- **Fennel seed oil**
- **Curcumin**

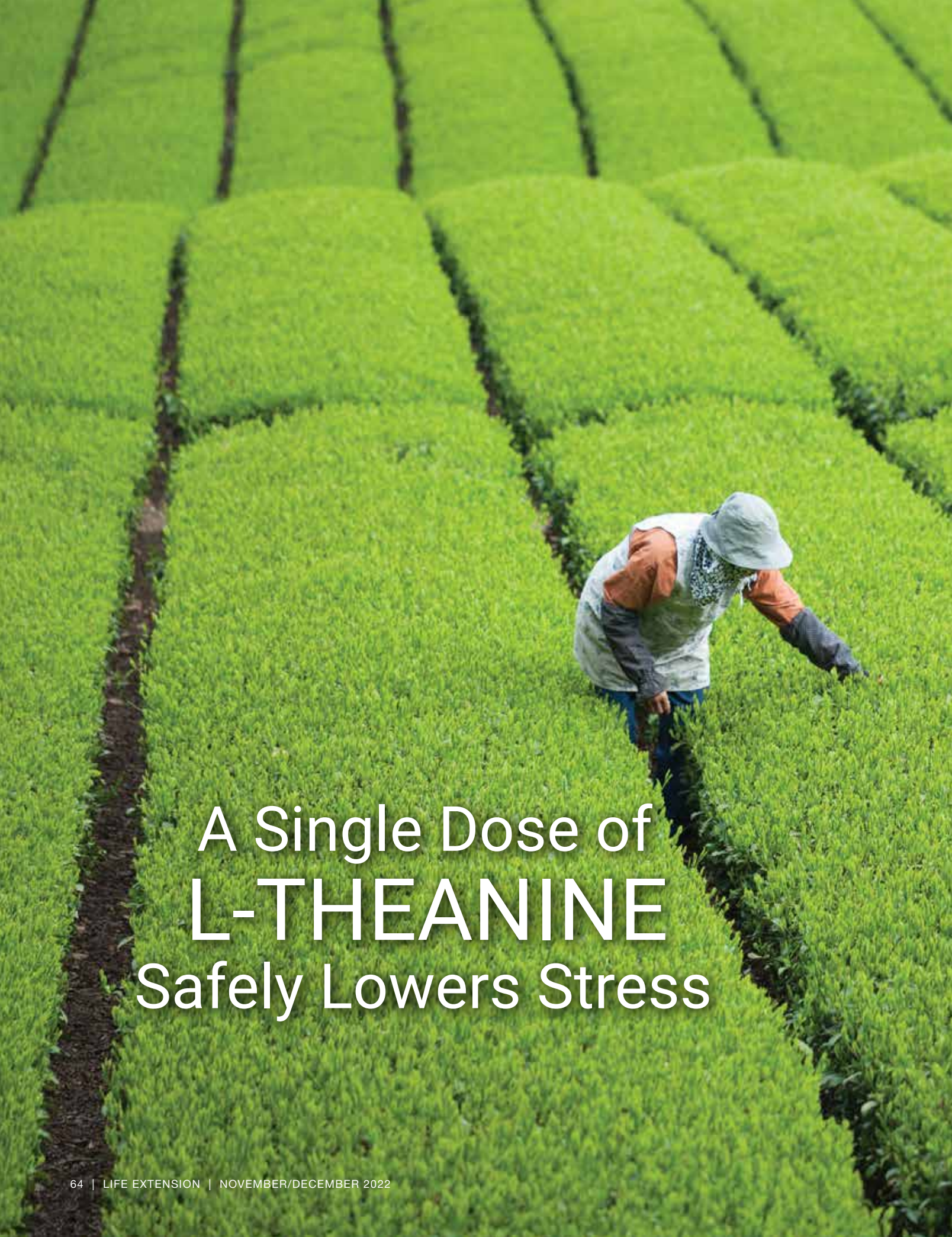
For maximum benefit, take **one** softgel **twice daily** before your heaviest meals.



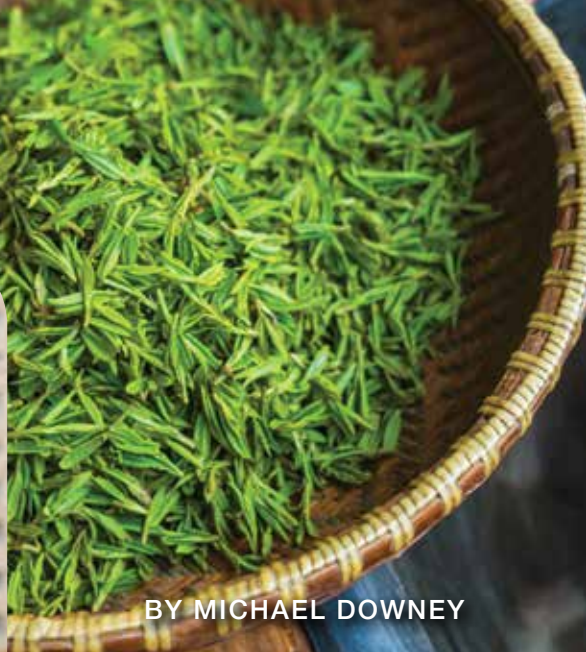
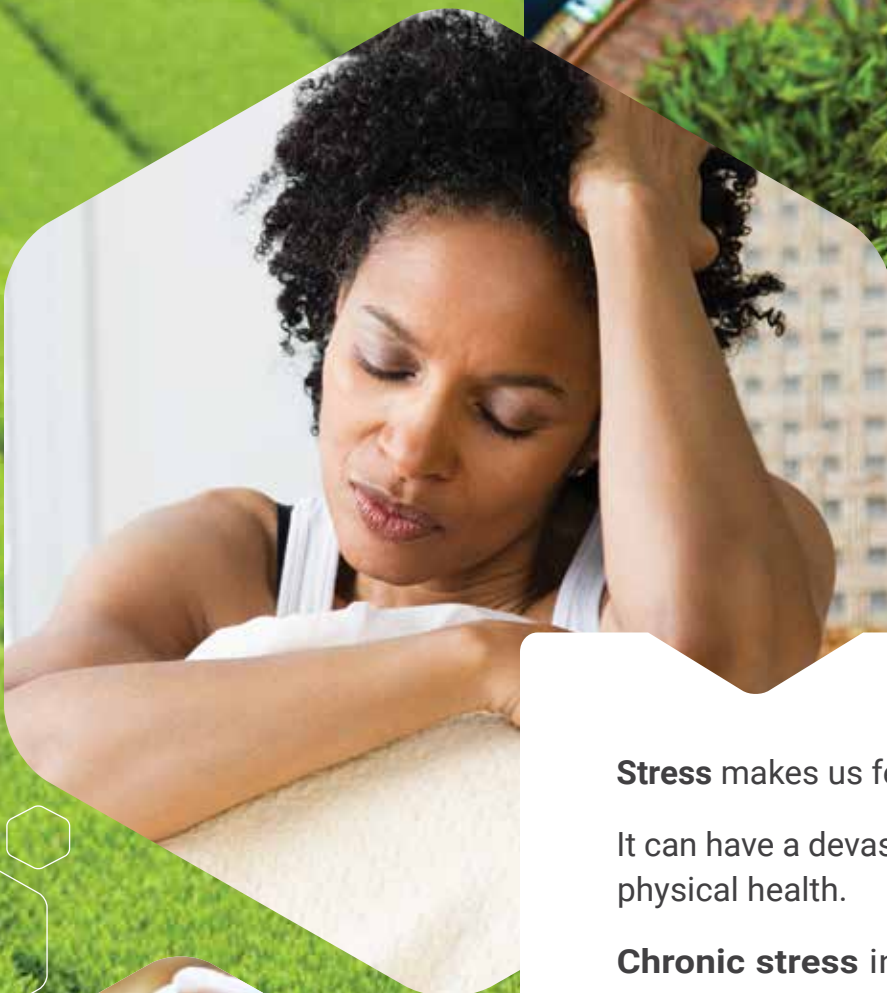
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A high-angle, full-page photograph of a tea plantation. The tea bushes are arranged in neat, parallel rows that recede into the distance, creating a strong sense of perspective. The leaves are a vibrant, healthy green. In the lower right quadrant, a person is seen from behind, wearing a light-colored bucket hat, a grey long-sleeved shirt, and a white protective vest. They are leaning forward, carefully tending to the tea plants. The overall scene is bright and clear, suggesting a sunny day.

A Single Dose of L-THEANINE Safely Lowers Stress



BY MICHAEL DOWNEY

Stress makes us feel miserable.

It can have a devastating impact on emotional and physical health.

Chronic stress increases cardiovascular risk, diminishes immune function, impairs cognition, induces gastrointestinal problems, contributes to depression, and more.¹

A compound found in **green tea** can help. This amino acid, named **L-theanine**, promotes **stress relief**, calm, and relaxation—*without* causing drowsiness.²

L-theanine is rapidly absorbed and cleared from the body. This causes some people to take multiple doses throughout the day to achieve sustained levels.

Using an *immediate- and extended-release technology*, scientists have found a way to allow **L-theanine** to stay in the body for **up to six hours**.

One study in **moderately stressed** adults found that a **single dose** of this form of L-theanine led to a greater *increase* in indicators of **relaxation** compared to placebo.³



Deadly Effects of Chronic Stress

Repeated or unrelenting **stress** leads to a higher risk for cardiovascular disease, diminished immune function, and damaging inflammation.^{1,4}

One of the most widely recognized health effects of **chronic stress** is an increased risk of **heart disease**.

Chronic stress has been shown to impair cardiac⁵ function and can cause high blood pressure, arrhythmia, and vascular inflammation leading to atherosclerosis and stroke.⁶

Most anti-stress or anti-anxiety drugs cause **sedation** and other side effects and can be addictive.⁷ So, scientists have been investigating **plant extracts** that may safely reduce stress and anxiety without side effects.

L-Theanine Lowers Stress

Researchers have long been investigating an amino acid called **L-theanine** that is found primarily in the leaves of **green tea**. Studies show it is able to cross the blood-brain barrier.²

L-theanine has demonstrated anti-stress effects, including reductions in perceived stress and markers of stress response like blood pressure, heart rate, cortisol, and patterns of brain activity.⁸

This confirms earlier work that showed subjects taking **L-theanine** reported significantly less subjective stress than those taking **placebo**.⁹

Research has revealed that L-theanine generates a sense of **relaxation**, with alertness, through at least two mechanisms:¹⁰⁻¹⁸

1. Enhances production of the inhibitory (relaxing) neurotransmitter **GABA**, or **gamma amino butyric acid**.

(**GABA** then influences levels of **dopamine** and **serotonin** that also produce relaxing effects.)

2. **L-theanine** increases the brain's production of **alpha brain waves**. This creates a state of deep relaxation with **mental alertness**.

Results of Human Studies

Human trials confirm that **L-theanine** has relaxing properties that **relieve stress**.^{3,19}

In one study, pharmacy students undergoing high-stress clinical training who took **200 mg** of L-theanine twice daily reported feeling significantly **less stress** than those who took a placebo.⁹

Another clinical trial was done with healthy men and women, aged 21 to 47, who were *not* considered to be particularly stressed before the study.¹⁹

Each volunteer was subjected to **alpha brain wave** testing, which measures wakeful relaxation, and **heart rate** measurements. Then, a **stress** test was given and measurements were retaken.





Stress Relief Without Sedation

- **Stress** and anxiety can reduce emotional well-being, increase risk for many diseases, and shorten healthy lifespan.
- Anti-stress medications are often **sedative** and can be addictive.
- Clinical studies show that an amino acid found in green tea, **L-theanine**, promotes calm and relaxation and safely reduces stress without causing drowsiness.
- People taking just **one dose** of **200 mg** of L-theanine had reduced physiological indicators of stress.

Next, half the group was given **200 mg** of **L-theanine**, and half was given a **placebo**. The **stress** test was conducted twice more over the following 90 minutes. The alpha brain wave and heart rate tests were also repeated. Results showed that:¹⁹

- **Relaxed wakefulness** (measured by alpha brain wave activity) *increased* with L-theanine but not with the placebo,
- **Tension** and **anxiety** were *reduced* to a greater degree in the L-theanine group, and
- **Heart rates** were *lowered* by L-theanine, compared to placebo, a further sign of stress reduction.

A randomized, triple-blind, placebo-controlled, crossover study was done on healthy but **moderately stressed** adults aged 19 to 60 years.³

Study subjects took a **single dose** of **200 mg** of an **extended-release** form of **L-theanine**, or placebo.

All these volunteers took a mental arithmetic test in order to induce mental **stress**. There was a seven-day washout period between the L-theanine test and the placebo test.

Alpha brain wave activity, **salivary cortisol** levels, and vital signs were recorded before and after participants took the arithmetic test.

Increases in heart rate, blood pressure, and self-reported stress and anxiety confirmed that subjects experienced stress during the **stressful** mental test. However, compared to the placebo, **200 mg** of **L-theanine** led to *greater* alpha wave activity, indicating a *higher* level of relaxation without drowsiness, just **three hours** later.³

The “calming response” in brain activity was further supported by greater *decreases* in salivary **cortisol** levels, compared to placebo.

In other words, **L-theanine** reduced feelings of stress *and* physical markers of stress in the body.

Summary

Stress reduces quality of life and boosts the risk of chronic disorders and premature death.

L-theanine, an amino acid found in green tea, lowers stress and promotes relaxation while maintaining alertness.

Unlike anti-anxiety drugs, L-theanine safely relieves stress *without* causing drowsiness.

L-theanine is rapidly absorbed, but then rapidly cleared from the body. Using an *immediate-* and *extended-release technology*, scientists have found a solution to this, allowing L-theanine to stay in the body for up to six hours.

Human trials have shown that L-theanine reduces signs of stress after just a **single 200 mg dose**. •

References

1. Yaribeygi H, Panahi Y, Sahraei H, et al. The impact of stress on body function: A review. *EXCLI J*. 2017;16:1057-72.
2. Williams JL, Everett JM, D'Cunha NM, et al. The Effects of Green Tea Amino Acid L-Theanine Consumption on the Ability to Manage Stress and Anxiety Levels: a Systematic Review. *Plant Foods Hum Nutr*. 2020 Mar;75(1):12-23.
3. Evans M, McDonald AC, Xiong L, et al. A Randomized, Triple-Blind, Placebo-Controlled, Crossover Study to Investigate the Efficacy of a Single Dose of AlphaWave(R) L-Theanine on Stress in a Healthy Adult Population. *Neurol Ther*. 2021 Dec;10(2):1061-78.
4. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK493173/>. Accessed August 15, 2022.
5. Lampert R, Tuit K, Hong KI, et al. Cumulative stress and autonomic dysregulation in a community sample. *Stress*. 2016 May;19(3):269-79.
6. Fioranelli M, Bottaccioli AG, Bottaccioli F, et al. Stress and Inflammation in Coronary Artery Disease: A Review Psychoneuroendocrin-immunology-Based. *Front Immunol*. 2018;9:2031.
7. Fluyau D, Revadigar N, Manobianco BE. Challenges of the pharmacological management of benzodiazepine withdrawal, dependence, and discontinuation. *Ther Adv Psychopharmacol*. 2018 May;8(5):147-68.
8. Turkozu D, Sanlier N. L-theanine, unique amino acid of tea, and its metabolism, health effects, and safety. *Crit Rev Food Sci Nutr*. 2017 May 24;57(8):1681-7.
9. Unno K, Tanida N, Ishii N, et al. Anti-stress effect of theanine on students during pharmacy practice: positive correlation among salivary alpha-amylase activity, trait anxiety and subjective stress. *Pharmacol Biochem Behav*. 2013 Oct;111:128-35.
10. Foxe JJ, Snyder AC. The Role of Alpha-Band Brain Oscillations as a Sensory Suppression Mechanism during Selective Attention. *Front Psychol*. 2011 2011-July-05;2(154):154.
11. Kobayashi K. Effects of L-theanine on the release of alpha-brain waves in human volunteers. *Journal of the Agricultural Chemical Society of Japan*. 1998;72(2):153-7.
12. Nobre AC, Rao A, Owen GN. L-theanine, a natural constituent in tea, and its effect on mental state. *Asia Pac J Clin Nutr*. 2008;17 Suppl 1:167-8.
13. Song CH, Jung JH, Oh JS, et al. Effects of theanine on the release of brain alpha waves in adult males. *Korean J Nutr*. 2003;36(9):918-23.
14. White DJ, de Klerk S, Woods W, et al. Anti-Stress, Behavioural and Magnetoencephalography Effects of an L-Theanine-Based Nutrient Drink: A Randomised, Double-Blind, Placebo-Controlled, Crossover Trial. *Nutrients*. 2016 Jan 19;8(1).
15. Yoto A, Motoki M, Murao S, et al. Effects of L-theanine or caffeine intake on changes in blood pressure under physical and psychological stresses. *J Physiol Anthropol*. 2012 Oct 29;31:28.
16. Nathan PJ, Lu K, Gray M, et al. The neuropharmacology of L-theanine(N-ethyl-L-glutamine): a possible neuroprotective and cognitive enhancing agent. *J Herb Pharmacother*. 2006;6(2):21-30.
17. Vuong QV, Bowyer MC, Roach PD. L-Theanine: properties, synthesis and isolation from tea. *J Sci Food Agric*. 2011 Aug 30;91(11):1931-9.
18. Di X, Yan J, Zhao Y, et al. L-theanine protects the APP (Swedish mutation) transgenic SH-SY5Y cell against glutamate-induced excitotoxicity via inhibition of the NMDA receptor pathway. *Neuroscience*. 2010 Jul 14;168(3):778-86.
19. Campbell A, Sixtus R. The Effects Of The Alphawave® L-Theanine Study Product On Relaxation, Clarity And Cognitive Function. 2016.





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Theanine XR™ Stress Relief promotes **alert relaxation** and a feeling of well-being *throughout the day.**

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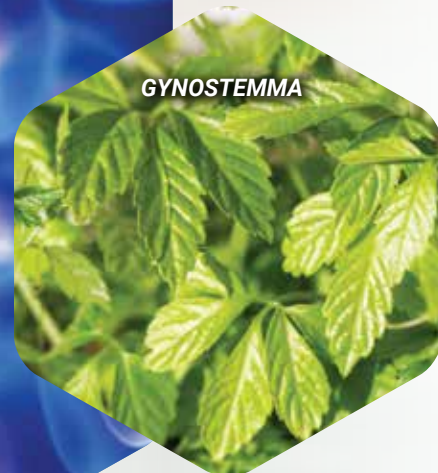
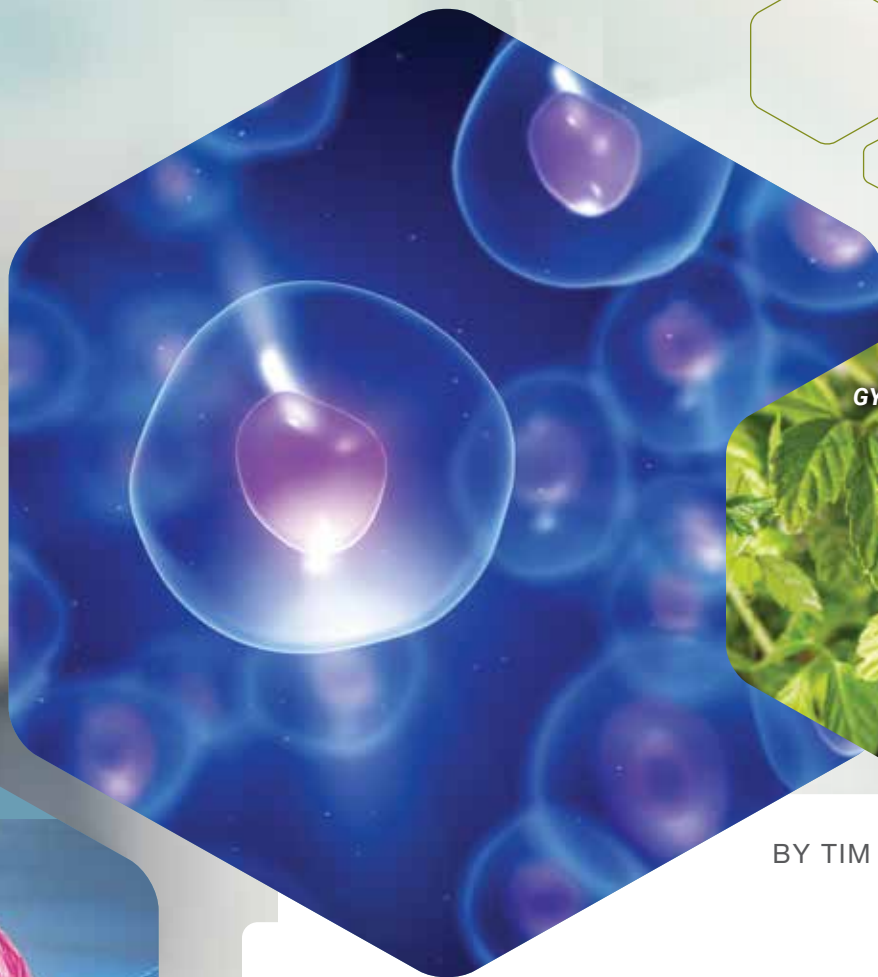
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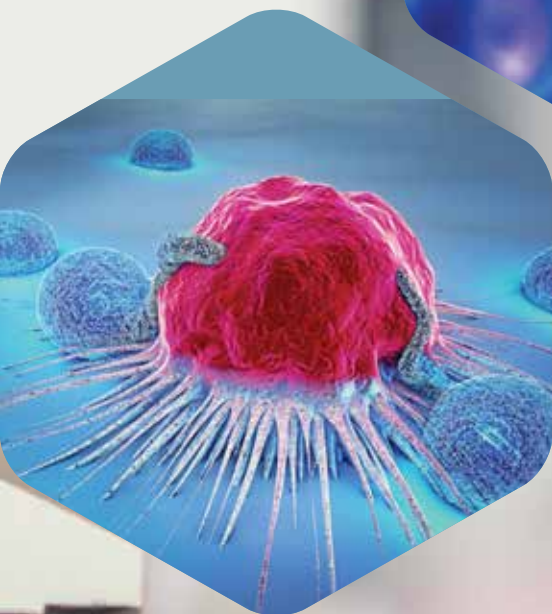
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A close-up, side-profile photograph of a male scientist wearing a white lab coat and clear safety goggles. He is looking intently through the eyepiece of a light-colored compound microscope. The background is a blurred laboratory setting with various equipment and shelves. The text "Cancer-Fighting Properties of GYNOSTEMMA" is overlaid in a green, sans-serif font on the left side of the image.

Cancer-Fighting Properties of *GYNOSTEMMA*



BY TIM CHASEN



Searching for plants with **anti-cancer** activity, scientists focused on a vine native to parts of Asia called ***Gynostemma pentaphyllum***.

Long used to promote **longevity**, modern research has identified in it a treasure trove of **anti-cancer** compounds.¹

A review paper of cell and animal studies presented data on *Gynostemma*'s potential effects against leukemia, colon cancer, prostate cancer, lung cancer, breast cancer, and more.¹

Cancer-Fighting Compounds

Gynostemma pentaphyllum contains more than **230** different compounds in multiple classes, including saponins, sterols, flavonoids, and others.¹

Dozens of these nutrients have been studied and most have demonstrated **anti-cancer** activities against different cancer types.

One review article listed **28 specific compounds** in *Gynostemma* that have **anti-cancer activity** in vitro. That *doesn't* include the flavonoids and carotenoids it contains, which *also* have **cancer-fighting** properties in vitro.¹

Reducing Cancer Growth

Studies in cell cultures and animal models have demonstrated this plant's **anti-cancer** properties.¹

In animals given *Gynostemma*, the **size** and **weight** of tumors is significantly reduced.²⁻⁵

Some of these studies found that *Gynostemma* attacked **cancer cells** and boosted the animals' **immune response** to the tumor.^{3,6-8}

Gynostemma also appears to have synergistic effects with other anti-cancer compounds. For example, in a mouse model of **colorectal cancer**, co-treatment with the chemotherapy drug **5-fluorouracil** enhanced the drug's effectiveness.⁹

Early Human Trials

Evidence from studies in the 1990s mentions that *Gynostemma* intake enhances **immune function** even when patients are undergoing chemotherapy, which *impairs* immune function.¹

An early observational study showed lower rates of cancer relapse and metastasis as well as lower **mortality rates** and improved **immune function**.

Research interest on the benefits of *Gynostemma* has increased markedly over the past decades. We await and look forward to reporting new evidence as it becomes available.

How *Gynostemma* Works

With its many bioactive compounds, *Gynostemma* induces several beneficial mechanisms all at once.

In general, *Gynostemma* modulates the activity of several cellular *signaling* pathways tied to cancer formation and progression.

For example, it activates **AMPK**, while blocking **mTOR** and the associated **PI3K/Akt**.^{1,10-12}

These pathways are involved in many aspects of cancer progression. These same mechanisms are found for other anti-cancer compounds being explored, such as the drug **metformin**.



WHAT
YOU
NEED
TO
KNOW

Gynostemma's Cancer-Fighting Actions

- *Gynostemma pentaphyllum*, also known as jiaogulan, is an Asian plant containing hundreds of different bioactive compounds. Many have been studied and found to have **anti-cancer** activities.
- In cell culture and animal models, *Gynostemma* has been shown to stop the **growth and spread** of cancer, cause cancer cells to die off, and help the immune system attack cancer.
- *Gynostemma* acts by modulating the activity of several cellular signaling pathways tied to cancer formation and progression.

Gynostemma's mechanisms are associated with effects that have been observed in various studies. Some of the most notable include:¹

- **Cell cycle arrest.** When cancer cells grow and reproduce, they pass through a complex pathway known as the **cell cycle**. In multiple cancer types, studies have shown that *Gynostemma* modulates the activity of several proteins involved in cell cycle regulation, **stopping the growth of cancer cells**.
- **Induction of cell death.** When normal cells are aged or damaged, they die off through a beneficial process called **apoptosis**. Cancer cells *shut off* this process, evading death. *Gynostemma* acts to *re-activate* apoptosis, **killing off** these abnormal cells.
- **Inhibition of invasion and metastasis.** The lethality of cancers lies mainly in their ability to invade surrounding healthy tissues and **metastasize** (spread) to distant sites in the body. *Gynostemma* blocks several pathways involved in invasion and metastasis.

- **Interfering with cancer cell metabolism.** Cancer cells need nutrients and energy to grow. *Gynostemma* has been found to alter the function of key enzymes involved in cancer cell metabolism, **starving cancer cells of energy** and further blocking their ability to grow and reproduce.
- **Immune support.** *Gynostemma* has been found to support key **immune system** functions, giving a boost to immune cells such as macrophages, T cells, and NK cells. This helps the body more effectively **fight and attack cancer**.

This wide range of mechanistic effects makes *Gynostemma* a potential adjuvant weapon in the battle against cancer.

Summary

Gynostemma pentaphyllum and its extracts contain hundreds of compounds, many of which have demonstrated, in pre-clinical studies, **anti-cancer** activities against a range of human cancer types.

By acting on different *signaling* pathways associated with cancer formation and progression, *Gynostemma* adds yet another ingredient with promising results in the fight against cancer.

Most people use **Gynostemma pentaphyllum** today to activate cellular **AMPK**, which suppresses excess **mTOR1**. This enables many people to lose excess **belly fat**.

The anti-cancer findings provide another reason for people to include **Gynostemma pentaphyllum** in their supplement program.

We look forward to new evidence on *Gynostemma*, which has attracted growing interest in recent decades. •

References

1. Li Y, Lin W, Huang J, et al. Anti-cancer effects of *Gynostemma pentaphyllum* (Thunb.) Makino (Jiaogulan). *Chin Med*. 2016;11:43.
2. Lin JJ, Hsu HY, Yang JS, et al. Molecular evidence of anti-leukemia activity of gypenosides on human myeloid leukemia HL-60 cells in vitro and in vivo using a HL-60 cells murine xenograft model. *Phytomedicine*. 2011 Sep 15;18(12):1075-85.
3. Liu J, Zhang L, Ren Y, et al. Anticancer and immunoregulatory activity of *Gynostemma pentaphyllum* polysaccharides in H22 tumor-bearing mice. *Int J Biol Macromol*. 2014 Aug;69:1-4.
4. Lu KW, Chen JC, Lai TY, et al. Gypenosides suppress growth of human oral cancer SAS cells in vitro and in a murine xenograft model: the role of apoptosis mediated by caspase-dependent and caspase-independent pathways. *Integr Cancer Ther*. 2012 Jun;11(2):129-40.
5. Xu C, Wang B, Ren S. The suppressive effect of gypenosides on murine s_(180) sarcoma and cultured erythroleukemia cell line k_(562). *Xi'an Yi Ke Da Xue Xue Bao*. 2002;23:217-9.
6. Du X-Y, Hou Y, Tan H, et al. Studies on the anti-tumor activity of polysaccharide from *Gynostemma pentaphyllum* and its mechanisms. *Sci Technol Eng*. 2009;20:5968-72.
7. Hsu HY, Yang JS, Lu KW, et al. An experimental study on the anti-leukemia effects of gypenosides in vitro and in vivo. *Integr Cancer Ther*. 2011 Mar;10(1):101-12.
8. Xu C, Wang B, Ren S. The suppressive effect of gypenosides on murine S180 sarcoma and cultured erythroleukemia cell line K562. *Xi'an Yi Ke Da Xue Xue Bao*. 2002;23:217-9.
9. Kong L, Wang X, Zhang K, et al. Gypenosides Synergistically Enhances the Anti-Tumor Effect of 5-Fluorouracil on Colorectal Cancer In Vitro and In Vivo: A Role for Oxidative Stress-Mediated DNA Damage and p53 Activation. *PLoS One*. 2015;10(9):e0137888.
10. Gauhar R, Hwang SL, Jeong SS, et al. Heat-processed *Gynostemma pentaphyllum* extract improves obesity in ob/ob mice by activating AMP-activated protein kinase. *Biotechnol Lett*. 2012 Sep;34(9):1607-16.
11. Li X, Liu H, Lv C, et al. Gypenoside-Induced Apoptosis via the PI3K/AKT/mTOR Signaling Pathway in Bladder Cancer. *Biomed Res Int*. 2022;2022:9304552.
12. Liu H, Li X, Duan Y, et al. Mechanism of gypenosides of *Gynostemma pentaphyllum* inducing apoptosis of renal cell carcinoma by PI3K/AKT/mTOR pathway. *J Ethnopharmacol*. 2021 May 10;271:113907.



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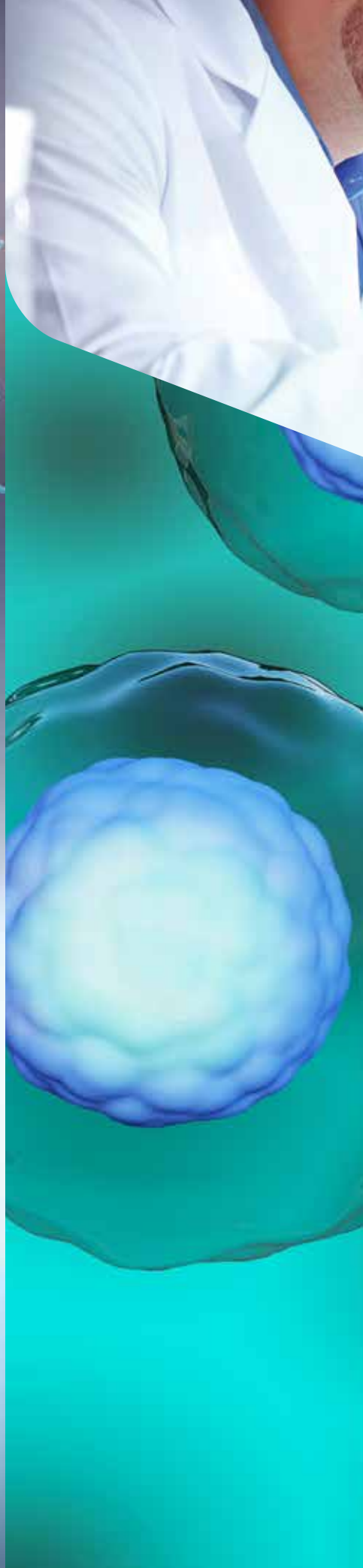
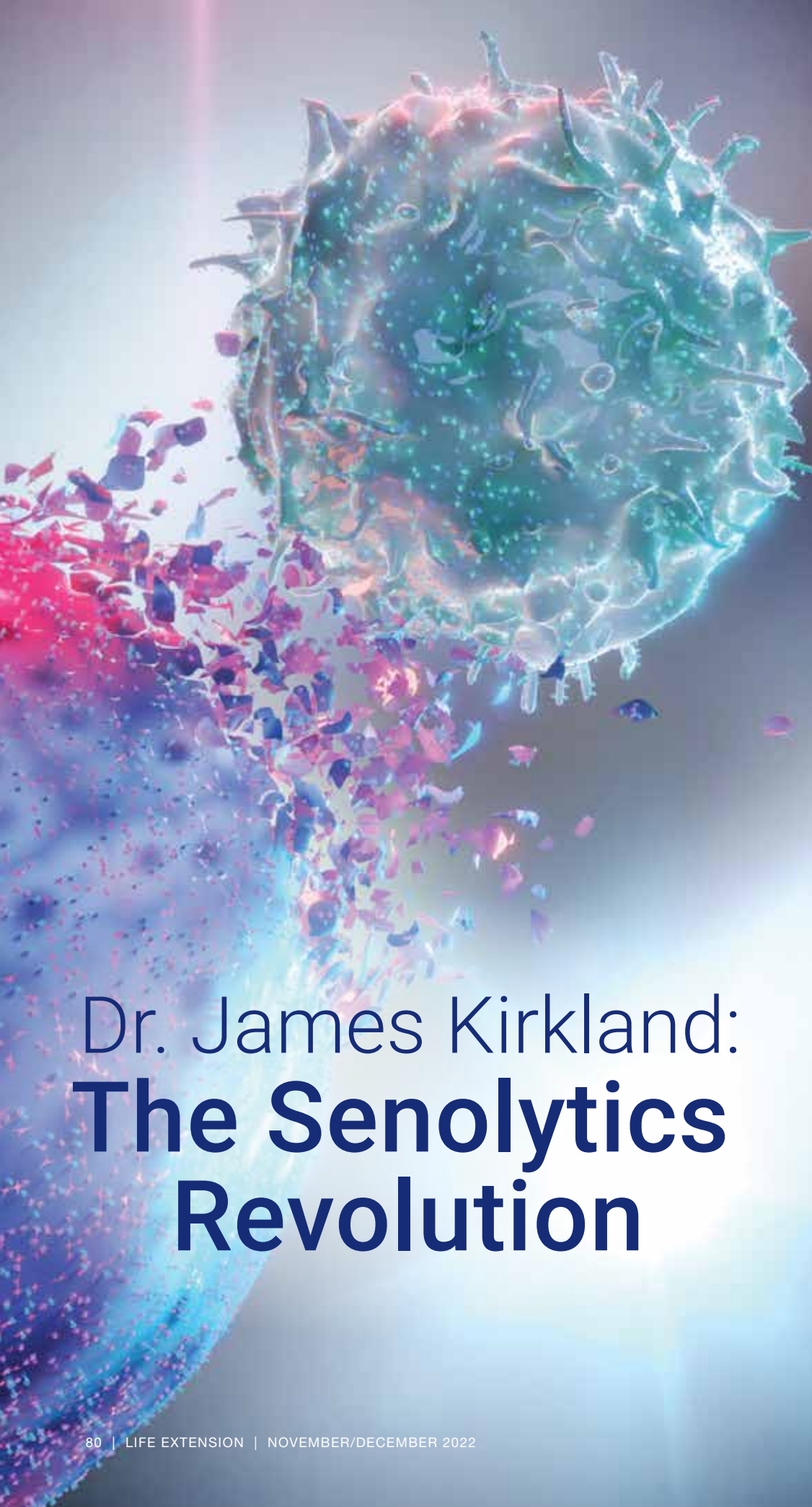


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Dr. James Kirkland: **The Senolytics Revolution**



James Kirkland, MD, PhD

BY MICHAEL DOWNEY

James Kirkland, MD, PhD, and his **Mayo Clinic** team are spearheading research that aims to prevent or reverse multiple diseases of aging.

Compounds known as **senolytics** are being tested in 16 clinical (**human**) trials.¹

Early evidence suggests they may do *more* than target chronic diseases. They may also counteract certain **aging processes**.

Dr. Kirkland, along with a growing number of scientists, believes the body's accumulation of **senescent cells** is a critical factor in disease, frailty, and aging.

His research is focused on identifying and testing agents that safely *remove* these toxic, old cells.

In the **August 2022** issue of ***Nature Medicine***, Dr. Kirkland and two Mayo Clinic colleagues note that **senescent cells** are a target for "**disorders across the lifespan**."²

Senescent Cells

Ideally, old cells begin a programmed sequence of self-destruction, known as **apoptosis**, and are cleared away by the immune system.

But **senescent cells** behave differently. They *don't* self-destruct.

Instead, they linger and emit a toxic mix of **protein-degrading enzymes** that damage healthy cells. They also secrete **pro-inflammatory** factors that contribute to chronic low-grade inflammation.³

Dr. Kirkland attributes the accumulation of **senescent cells** to be causative factors of degenerative **aging** and chronic diseases.

These **senescent cells** are what Dr. Kirkland and others seek to safely eliminate.

Dangers of Senescence

The idea that removing senescent cells could boost **longevity** was based partly on the observation that mice with mutations that *increase* lifespan have *fewer* senescent cells than normal mice. Similarly, very short-lived mice have more **senescent cells**.⁴

In studies in some human cell and animal models, removing senescent cells from the body improves markers of aging and **prolongs lifespan**.⁵⁻⁹

Senescent cells also *increase* in a number of **chronic diseases**.⁶

Dr. Kirkland and his collaborators are investigating the effects of eliminating senescent cells in models of Alzheimer's disease, arthritis, osteoporosis, frailty, and other disorders.

Senolytics

Compounds called **senolytics** have the capacity to safely sweep away senescent cells.^{9,10}

They work by reactivating the **apoptosis** switch in senescent cells, causing these toxic cells to die off, and provide room for healthy, functioning cells.

Dr. Kirkland has worked intensively on the potential for senolytics to reverse a range of chronic diseases and increase human **longevity**.

Senolytics being tested include the anticancer drug **dasatinib**, the plant-based nutrients **quercetin**, **theaflavins**, and **fisetin**, and a growing list of related compounds.

The senolytic effects of these compounds have been documented in rodents and human cultured cells.



Compared to untreated mice, those that started a dasatinib-quercetin mix at an age equivalent to **75 to 90 years in humans** ended up living about **36% longer**, with better **physical function**.¹¹

Senolytics have effectively prevented, delayed, or alleviated a variety of conditions and diseases in mice.

Clinical trials currently underway for senescence-related diseases have shown early but clear signs of promise.

In humans, a brief course of senolytics enhanced several measures of physical activity in patients with **idiopathic pulmonary fibrosis**, a progressive lung disease.¹²

Daunting Roadblocks

Human trials of senolytics could change medicine forever. They could allow us to switch from treating *symptoms* to circumventing *root causes* of aging and age-related disease.

Of course, these trials can take many years, given the timeframe needed to observe a significant change in longevity.

Lack of funding delayed getting senolytic trials started. As Dr. Kirkland noted in the review of which he was a co-author, companies and entrepreneurs are generally uninterested in funding studies of nutrients or existing drugs because they're unable to patent them.²

Even more daunting, bureaucratic mandates and **regulatory red tape** are proving to be the greatest roadblock.

In a recent interview, Dr. Kirkland described the voluminous paperwork and endless regulatory hoops holding his team back.

Dr. Kirkland and his team wanted to study the plant compound **fisetin**, known to be a promising senolytic. Before getting approval, however, the U.S. Food and Drug Administration (FDA) forced them to compile a highly technical, **450-page** Independent New Drug report on fisetin.

Preparing this one document for FDA submission required **2.5 years**.

These roadblocks were erected despite over **5,000** Americans a day perishing from an age-related pathology.



The Promise of Senolytics

- **Senescent cells** cause damage that drives chronic disease and aging.
- **Senolytics** are compounds that safely cause senescent cells to die off. Known senolytics include the drug dasatinib and the nutrients **quercetin**, **theaflavins**, and **fisetin**.
- **Dr. James Kirkland** and his colleagues are leaders in the research into senolytics. Their research shows promise in boosting human lifespan.

Summary

Senescent cells are a major cause of accelerated aging and the development of chronic age-related disorders.

The research into **senolytics** by Dr. Kirkland and his colleagues at the **Mayo Clinic** seeks to delay the onset of multiple degenerative illnesses and increase healthy **human lifespans**. •

References

1. Available at: <https://clinicaltrials.gov/ct2/results?cond=&term=senolytic&cntry=&state=&city=&dist=>. Accessed September 7, 2022.
2. Chaib S, Tchkonja T, Kirkland JL. Cellular senescence and senolytics: the path to the clinic. *Nat Med*. 2022 Aug;28(8):1556-68.
3. Kumari R, Jat P. Mechanisms of Cellular Senescence: Cell Cycle Arrest and Senescence Associated Secretory Phenotype. *Front Cell Dev Biol*. 2021;9:645593.
4. Available at: <https://www.mayo.edu/research/faculty/kirkland-james-l-m-d-ph-d/bio-00096544>. Accessed September 1, 2022.
5. Zhu Y, Tchkonja T, Pirtskhalava T, et al. The Achilles' heel of senescent cells: from transcriptome to senolytic drugs. *Aging Cell*. 2015 Aug;14(4):644-58.
6. Kirkland JL, Tchkonja T. Cellular Senescence: A Translational Perspective. *EBioMedicine*. 2017 Jul;21:21-8.
7. Baker DJ, Wijshake T, Tchkonja T, et al. Clearance of p16Ink4a-positive senescent cells delays ageing-associated disorders. *Nature*. 2011 Nov 2;479(7372):232-6.
8. Jeon OH, Kim C, Laberge RM, et al. Local clearance of senescent cells attenuates the development of post-traumatic osteoarthritis and creates a pro-regenerative environment. *Nat Med*. 2017 Jun;23(6):775-81.
9. Kirkland JL, Tchkonja T, Zhu Y, et al. The Clinical Potential of Senolytic Drugs. *J Am Geriatr Soc*. 2017 Oct;65(10):2297-301.
10. Malavolta M, Bracci M, Santarelli L, et al. Inducers of Senescence, Toxic Compounds, and Senolytics: The Multiple Faces of Nrf2-Activating Phytochemicals in Cancer Adjuvant Therapy. *Mediators Inflamm*. 2018;2018:4159013.
11. Xu M, Pirtskhalava T, Farr JN, et al. Senolytics improve physical function and increase lifespan in old age. *Nat Med*. 2018 Aug;24(8):1246-56.
12. Justice JN, Nambiar AM, Tchkonja T, et al. Senolytics in idiopathic pulmonary fibrosis: Results from a first-in-human, open-label, pilot study. *EBioMedicine*. 2019 Feb;40:554-63.



Increase **AMPK** to Better Manage Body Weight



Most people today consume excess calories.

This results in **mTOR** constantly running at high gear, which is a factor in unwanted **fat storage**.

Studies show that increasing AMPK activity turns down excess **mTOR**.¹

Reduce Cell Fat Storage

Scientific studies show that increasing AMPK activity can encourage cells to store less fat and burn it as energy.^{2,3}

AMPK Metabolic Activator was formulated based on data showing reduced belly fat in response to just one of its ingredients (*Gynostemma pentaphyllum*).³

This *Gynostemma pentaphyllum* + *hesperidin* formula is designed to support healthy **AMPK** cellular activation.

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James

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

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References

1. *Anticancer Agents Med Chem.* 2013 Sep;13(7):967-70.
2. *Nutr J.* 2016;15:6.
3. *Obesity (Silver Spring).* 2014;22(1):63-71.

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The Secret to Longevity in Life and Love

BY LAURIE MATHENA



At 95 years old, Marion Ferdinand Hess, Sr., has lived a life that has defied the odds.

He survived a premature birth, fighting in World War II, and two deadly hurricanes in his hometown of New Orleans.

He has been married to his wife, Jean, for 75 years.

And he is in the **10%** of men over 90 years old who do not have prostate cancer.

Now, Marion attributes his longevity to the vitamins he and his wife started taking for prevention over 25 years ago.

The Early Years

At age 17, Marion enlisted in the army to fight in World War II. He was immediately deployed to Germany, where he landed under fire, and he served under General Patton until the end of the war.

Soon after returning home from the war, Hess met his future wife, Jean Catherine Meliet.

On September 20, 1947, Marion and Jean tied the knot just one day after one of the deadliest hurricanes to hit the gulf coast slammed into New Orleans, a category 2 hurricane with sustained winds of 110 mph.

Fifty-eight years before the infamous Hurricane Katrina, Hurricane George breached the 17th Street Canal, flooding buildings, causing massive power outages, and leaving standing water for weeks.

But Marion and Jean refused to cancel their wedding, and they were married the following night.

"There was no electricity," recalled Jean, "so my mother placed lanterns around the church for lighting. She also hired a band for dancing and entertainment, and she placed lanterns all around the reception hall. From that day on, my mother treated Marion like her son."

Overcoming Family Medical History

Marion and Jean did not have an encouraging family medical history. Many of their family members had passed away at a young age from conditions like cancer, heart attack, and stroke.

It appeared as if Jean might follow in their footsteps.

In 2005, at the age of 76, Jean was diagnosed with type II diabetes. She was overweight, and her hemoglobin **A1C level** was over **6.6**.

That's when their daughter, Melissa Hess, stepped in and took Jean to see Dr. Samuel Andrews, an endocrinologist in New Orleans and author of the well-known diet book, *Sugar Busters*.

Dr. Andrews told Jean that the only way to control her diabetes was to lose weight. Melissa took it a step further and told Dr. Andrews that her mother would not only lose the weight but would reverse her diabetes.

Jean lost 40 pounds in one year, changed her diet, and at her daughter's recommendation, she started taking targeted supplements for diabetes and glucose control from **Life Extension**.

Before long, her Hemoglobin A1c level dropped down to below **6.0**.

Jean said, "After taking these supplements for quite a while—and losing weight—I went back to see Dr. Andrews. He said, 'Mrs. Hess, I'm proud to say that you're not a diabetic anymore.' I couldn't believe it!"

Their Life Extension Journey

Since 1996, Marion and Jean have taken Life Extension® supplements every day as part of their personal prevention protocol.

They had learned that in order to maintain their cognitive function and prevent conditions like cancer and heart disease, they had to take action long *before* those conditions arose.

They now believe their efforts have paid off.

"I attribute my longevity to my vitamins," said Jean.

Between the two of them, Marion and Jean take over 50 supplements every day, and they get their blood tested every other month to stay on top of any health problems that might arise.

The blood tests continue to show that Marion's bloodwork looks more like a 30-year-old than a 95-year-old. Marion has very little gray hair and looks younger than his age, which he attributes to his daily supplements.

In addition, a recent biopsy revealed that Marion is free of prostate cancer, a claim only **10%** of men in their 90s can make.

Even their dog, Lucki, a Hurricane Katrina survivor that was rescued from a rooftop in a flooded area of New Orleans, is given supplements and remains spry at 18 years old.

Every day, Lucki is given a multi-vitamin, vitamin C, carnitine, taurine, ubiquinol, ginkgo biloba, collagen, calcium, vitamin D, probiotics, lutein, and many more.

"It's all about prevention," said daughter Melissa. "You have to start many years ahead of time to prevent dementia, heart diseases, autoimmune conditions, and cancers."



Marion and Jean's Daily Supplements

- | | |
|---|--|
| <ul style="list-style-type: none"> • Advanced Milk Thistle • AppleWise • Arterial Protect • Arthro-Immune Joint Support with PARACTIN® • ArthroMax® Advanced with NT² Collagen & AprèsFlex® • Bifido GI Balance • Bone Restore with Vitamin K2 • Calcium Citrate with Vitamin D • Cognitex® Basics • Cognitex® Elite • Daily Skin Defense • DMAE Bitartrate • Endothelial Defense® Pomegranate Plus • Enhanced Stress Relief • EsophaCool® Berry Flavor • Eye Pressure Support with Mirtogenol® • Fast-Acting Joint Formula • FLORASSIST® Daily Bowel Regularity • FLORASSIST® GI with Phage Technology • FLORASSIST® Heart Health • FLORASSIST® Mood Improve • Gamma E Mixed Tocopherols & Tocotrienols • Ginkgo Biloba Certified Extract™ 120 mg • Glycemic Guard™ • Homocysteine Resist • MacuGuard® Ocular Support with Saffron & Astaxanthin • Magnesium Caps 500 mg • Melatonin 6 Hour Timed Release 300 mcg | <ul style="list-style-type: none"> • Mitochondrial Energy Optimizer with PQQ • N-Acetyl-L-Cysteine (NAC) • NAD+ Cell Regenerator® and Resveratrol • Neuro-Mag® • Optimized Carnitine • Optimized Cran-Max® with Ellirose® • Optimized Folate L-Methylfolate 1700 mcg • Optimized Resveratrol • PalmettoGuard® • Potassium with Extend-Release Magnesium • Pro-Resolving Mediators • Pyridoxal 5'-Phosphate Caps 100 mg • Quick Brain Nootropic • Shade Factor® • Super Carnosine 500 mg • Super K Elite • Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin • Super Selenium Complex with Vitamin E • Taurine 1,000 mg • Tri Sugar Shield® • Two-Per-Day Multivitamin • Ultra Prostate Formula • Vanadyl Sulfate • Vitamin D3 - 7000 IU • VenoFlow® • Venotone Standardized Horse Chestnut |
|---|--|

Words of Wisdom

Through decades and wars, natural disasters and pandemics, Marion and Jean have defied the odds in life, in health, and also in their relationship.

In September of 2022, they celebrated 75 years of marriage, and together they have three children, three grandchildren, and four great grandchildren.

Jean says that their secret to staying together is that “You have to agree with each other, enjoy each other, and never go to bed mad at night. Always keep a smile on your face.”

No doubt Marion has been instrumental in keeping everyone smiling.

When his doctors ask him why he's taking so many vitamins and supplements, he gets a twinkle in his eyes and responds, “My daughter wants me to die healthy.” •

PHOTO 1: Wedding photo on September 20, 1947. Marion was 20 and Jean was 18.

PHOTO 2: Marion and Jean with daughter, Melissa Hess, at a wedding in New Orleans on May 20, 2006. Marion was 79 and Jean was 77.

PHOTO 3: 60th Wedding Anniversary dinner party in New Orleans on September 20, 2007. Marion was 80 and Jean was 78.

PHOTO 4: 72nd Wedding Anniversary dinner in New Orleans on September 20, 2019. Marion was 92 and Jean was 90.

"I feel like I will be healthy
for the long haul."

Wendy

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Your House at the Cellular Level



Item #02301

36 vegetarian capsules

Normal aging results in a buildup of **senescent cells**.

Senolytic Activator® provides four ingredients, including a potent dose of **Bio-Fisetin**, to help you manage these **senescent cells**.

The suggested dose is 3 capsules just ONE time each week.

This product is available at fine health food stores everywhere.



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.

Maintain Endothelial Plaque Stability with **ARTERIAL PROTECT**



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

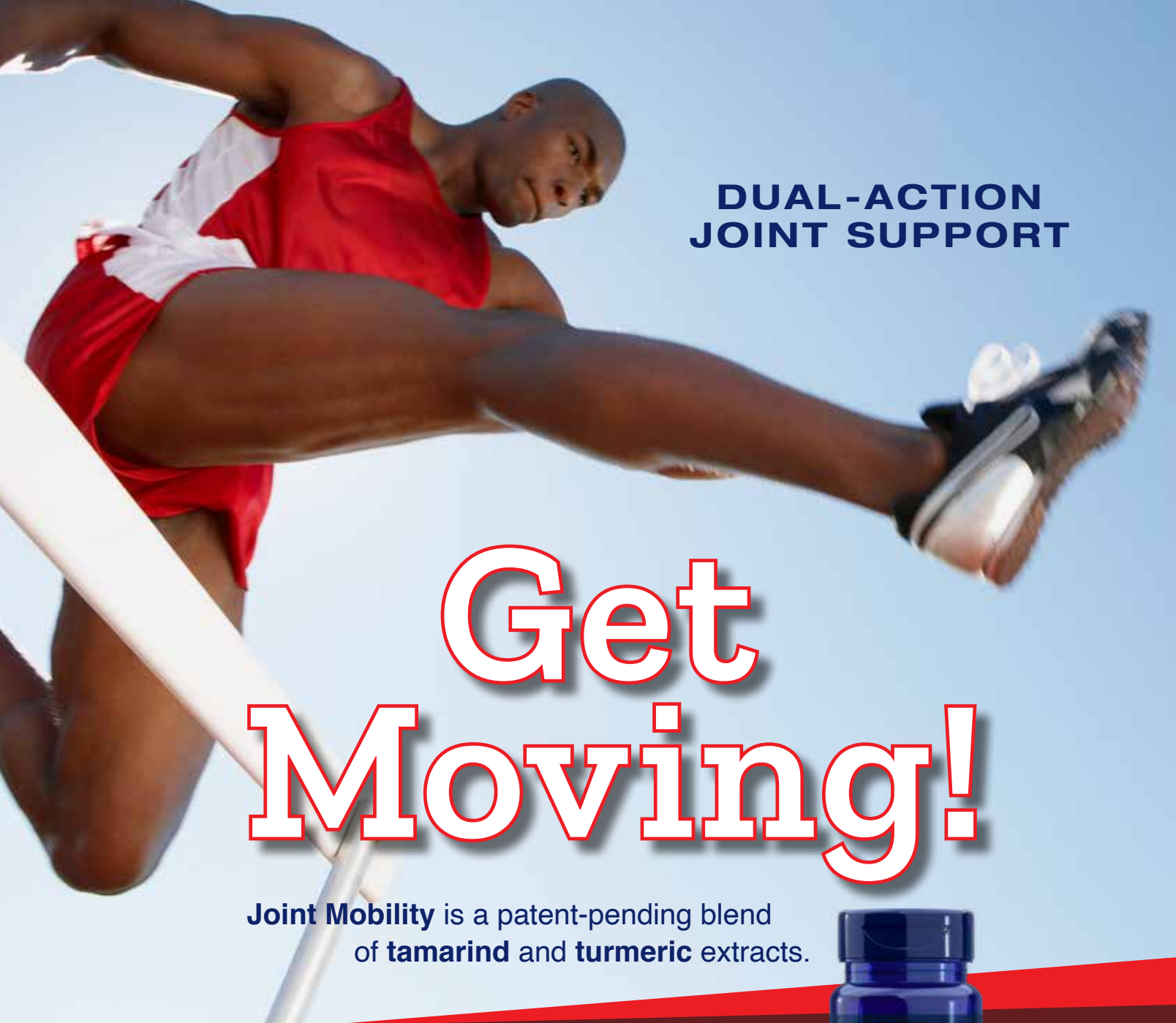
30 vegetarian capsules



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

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JOINT SUPPORT**

Get Moving!

Joint Mobility is a patent-pending blend
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A placebo-controlled **clinical trial*** shows these
plant extracts help:

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



Item #02424

60 vegetarian capsules
Each capsule provides 200 mg
of tamarind-turmeric extract

This product is available at fine health food stores everywhere.

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



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What Is Chlorophyllin?

BY LAURIE MATHENA



We are surrounded by environmental toxins.

Currently, there are more than **80,000** chemicals registered or listed under the Toxic Substance Control Act.¹

In 2020, approximately **three billion** pounds of these toxic chemicals—many known carcinogens—were released into the environment.²

More disturbing is the fact that most of these chemicals were never adequately tested by any government agency regarding their effects on human health.³

Studies now show that these chemicals can contribute to diabetes, heart disease, and cancer by causing **mutations** to our DNA.⁴⁻⁸

You can't avoid exposure to these toxins, but you *can* take steps to minimize their harmful impact on your body.

An inexpensive compound called **chlorophyllin** helps **detoxify** these deadly chemicals from your body, while offering critical protection for your DNA.

Protection Against Numerous Types of Cancer

Chlorophyllin is a water-soluble derivative of the green plant substance **chlorophyll**.

Life Extension® reported on the **antimutagenic** properties of chlorophyllin in the mid-**1980s**. Since then, numerous studies have been published showing chlorophyllin's ability to protect against multiple types of cancer.

The liver is especially at risk because its job is to cleanse the body of these harmful toxins.

Out of the 600,000 new cases of **liver cancer** diagnosed yearly, it is estimated that up to **28%** of them are caused by **aflatoxin**, which is found in multiple improperly stored foods, including peanuts, corn, pistachios, and rice.⁹

Chlorophyllin binds to the carcinogenic byproducts of aflatoxin metabolism, which decreases the bioavailability of these cancer-causing chemicals.^{10,11}



In this way, chlorophyllin has the potential to **significantly reduce the risk of liver cancer** induced by aflatoxin.

Additionally, chlorophyllin has been shown to protect against the following:

- **Oral Cancer:** A study in hamsters showed that chlorophyllin can prevent genetic mutations and reverse gene expression linked to oral cancer caused by the chemical dimethylbenzanthracene (DMBA).^{7,12}
- **Pancreatic Cancer:** Chlorophyllin has antiproliferative effects on pancreatic cells.¹³
- **Colon Cancer:** When colon cancer cells were treated with chlorophyllin, it inhibited the enzyme ribonucleotide reductase (RR), which made these cancer cells less able to grow and more receptive to mainstream cancer chemotherapeutic agents.¹⁴
- **Bladder Cancer:** The combination of chlorophyllin with photodynamic therapy resulted in approximately **85%** destruction of bladder cancer cells.¹⁵
- **Breast Cancer:** When human breast cells were exposed to the carcinogen dibenzopyrene (DBP), dangerous and unstable DNA adducts were formed. However, adding chlorophyllin to the breast cells led to a **65%** decrease in the number of DNA adducts.¹⁶ Formation of DNA adducts is an early step in the formation of cancer-causing DNA mutations.¹⁷
- **Stomach Cancer:** Chlorophyllin has been shown to help stop the growth and metastasis of stomach cancer in rats.¹⁸

Anticarcinogenic Pathways

Chlorophyllin protects against many types of cancer because it targets multiple pathways involved in cancer development.

This compound, associated with healthy green plants, has demonstrated **anticarcinogenic effects** against a variety of widespread environmental toxins.¹⁹

- **Chlorophyllin** helps prevent carcinogens such as **heterocyclic amines** from altering DNA to inflict malignant changes.²⁰
- It limits the formation of DNA adducts caused by known carcinogens, including dibenzanthracene, dibenzopyrene and benzophenanthrene.²¹
- It functions as an **antimutagenic agent** against chemicals such as **PhIP**, which are known to be involved in colon, prostate, pancreatic, and breast cancer.^{21,22}
- It protects against **mutations** of the **p53 tumor suppressor gene**. Protecting healthy expression of **p53** is a critical factor that helps guard against **cancerous** changes.²³

Proper use of **chlorophyllin** affords considerable defense against the natural and man-made toxins that permeate our food and environment.

Health-conscious individuals sometimes take around **100 mg of chlorophyllin** with heavy meals to protect DNA from environmental and dietary **mutagens**. •



References

1. Available at: <https://www.epa.gov/science-matters/science-matters-articles-related-safer-chemicals-research>. Accessed June 3, 2022.
2. Available at: <https://www.epa.gov/trination-alanalysis/releases-chemicals>. Accessed June 3, 2022.
3. Thornton JW, McCally M, Houlihan J. Bio-monitoring of industrial pollutants: health and policy implications of the chemical body burden. *Public Health Rep*. 2002 Jul-Aug;117(4):315-23.
4. Lee HK. Mitochondrial dysfunction and insulin resistance: the contribution of dioxin-like substances. *Diabetes Metab J*. 2011 Jun;35(3):207-15.
5. Jia G, Aroor AR, Martinez-Lemus LA, et al. Mitochondrial functional impairment in response to environmental toxins in the cardiorenal metabolic syndrome. *Arch Toxicol*. 2015 Feb;89(2):147-53.
6. Lim S, Cho YM, Park KS, et al. Persistent organic pollutants, mitochondrial dysfunction, and metabolic syndrome. *Ann N Y Acad Sci*. 2010 Jul;1201:166-76.
7. Auger C, Alhasawi A, Contavadoo M, et al. Dysfunctional mitochondrial bioenergetics and the pathogenesis of hepatic disorders. *Front Cell Dev Biol*. 2015;3:40.
8. Fosslie E. Cancer morphogenesis: role of mitochondrial failure. *Ann Clin Lab Sci*. 2008 Autumn;38(4):307-29.
9. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/>. Accessed June 3, 2022.
10. Jubert C, Mata J, Bench G, et al. Effects of chlorophyll and chlorophyllin on low-dose aflatoxin B(1) pharmacokinetics in human volunteers. *Cancer Prev Res (Phila)*. 2009 Dec;2(12):1015-22.
11. Egner PA, Wang JB, Zhu YR, et al. Chlorophyllin intervention reduces aflatoxin-DNA adducts in individuals at high risk for liver cancer. *Proc Natl Acad Sci U S A*. 2001 Dec 4;98(25):14601-6.
12. Vidya Priyadarsini R, Kumar N, Khan I, et al. Gene expression signature of DMBA-induced hamster buccal pouch carcinomas: modulation by chlorophyllin and ellagic acid. *PLoS One*. 2012;7(4):e34628.
13. Konickova R, Vankova K, Vanikova J, et al. Anti-cancer effects of blue-green alga *Spirulina platensis*, a natural source of bilirubin-like tetrapyrrolic compounds. *Ann Hepatol*. 2014 Mar-Apr;13(2):273-83.
14. Chimpoy K, Diaz GD, Li Q, et al. E2F4 and ribonucleotide reductase mediate S-phase arrest in colon cancer cells treated with chlorophyllin. *Int J Cancer*. 2009 Nov 1;125(9):2086-94.
15. Lihuan D, Jingcun Z, Ning J, et al. Photodynamic therapy with the novel photosensitizer chlorophyllin f induces apoptosis and autophagy in human bladder cancer cells. *Lasers Surg Med*. 2014 Apr;46(4):319-34.
16. Smith WA, Freeman JW, Gupta RC. Effect of chemopreventive agents on DNA adduction induced by the potent mammary carcinogen dibenzo[a,l]pyrene in the human breast cells MCF-7. *Mutat Res*. 2001 Sep 1;480-481:97-108.
17. Hwa Yun B, Guo J, Bellamri M, et al. DNA adducts: Formation, biological effects, and new biospecimens for mass spectrometric measurements in humans. *Mass Spectrom Rev*. 2020 Mar;39(1-2):55-82.
18. Thiagarajan P, Kavitha K, Thautam A, et al. Dietary chlorophyllin abrogates TGF-beta signaling to modulate the hallmark capabilities of cancer in an animal model of forestomach carcinogenesis. *Tumour Biol*. 2014 Jul;35(7):6725-37.
19. Nagini S, Palitti F, Natarajan AT. Chemopreventive potential of chlorophyllin: a review of the mechanisms of action and molecular targets. *Nutr Cancer*. 2015;67(2):203-11.
20. Hayatsu H. Complex formation of heterocyclic amines with porphyrins: its use in detection and prevention. *Princess Takamatsu Symp*. 1995;23:172-80.
21. Mata JE, Yu Z, Gray JE, et al. Effects of chlorophyllin on transport of dibenzo(a, l) pyrene, 2-amino-1-methyl-6-phenylimidazo-[4,5-b]pyridine, and aflatoxin B(1) across Caco-2 cell monolayers. *Toxicology*. 2004 Mar 1;196(1-2):117-25.
22. Hirose M, Nishikawa A, Shibutani M, et al. Chemoprevention of heterocyclic amine-induced mammary carcinogenesis in rats. *Environ Mol Mutagen*. 2002;39(2-3):271-8.
23. Gouda EM, Elbehairy AM, Ghoneim MA. Antimutagenic efficacy of some natural compounds on cyclophosphamide-induced p53 alterations. *Z Naturforsch C J Biosci*. 2008 Nov-Dec;63(11-12):857-63.

FORESIGHT FOR YOUR EYESIGHT

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- > **Lutein, trans-zeaxanthin, and meso-zeaxanthin** help maintain structural integrity of the **macula** and **retina**.¹⁻⁵
- > **Cyanidin-3-glucoside** assists with night vision.⁶⁻⁸
- > **Saffron** has been shown to help support **vision** as demonstrated by doctors' eye exams.¹
- > **Alpha-carotene** further helps support **macular density**.¹



These products are available at fine health food stores everywhere.

References

1. JAMA Ophthalmol. 2015;133(12):1415-24.
2. Nutrients. 2013 April;5(4):1169-85.
3. Nutrition. 2011 Sep;27(9):960-6.
4. Free Radic Biol Med. 2012;53(6):1298-307.
5. J Ophthalmol. 2015;2015:523027.
6. Evid Based Complement Alternat Med. 2012;2012:429124.
7. Invest Ophthalmol Vis Sci. 2010;51(12):6118-24.
8. J Agric Food Chem. 2003 Jun 4;51(12):3560-3.

**MacuGuard® Ocular Support
with Saffron + Astaxanthin**
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60 softgels

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Item #01992

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(Each bottle lasts for two months.)

MacuGuard® Ocular Support is available with or without astaxanthin.

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A single dose of common sleeping pills such as Xanax® can suppress production of **melatonin** and create other health issues.



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With **extended-release** forms, **L-theanine** can reduce stress for up to **six hours**.



72 CANCER-INHIBITING EFFECTS OF GYNOSTEMMA

Researchers have identified **anti-cancer** compounds in an Asian vine called *Gynostemma pentaphyllum*.