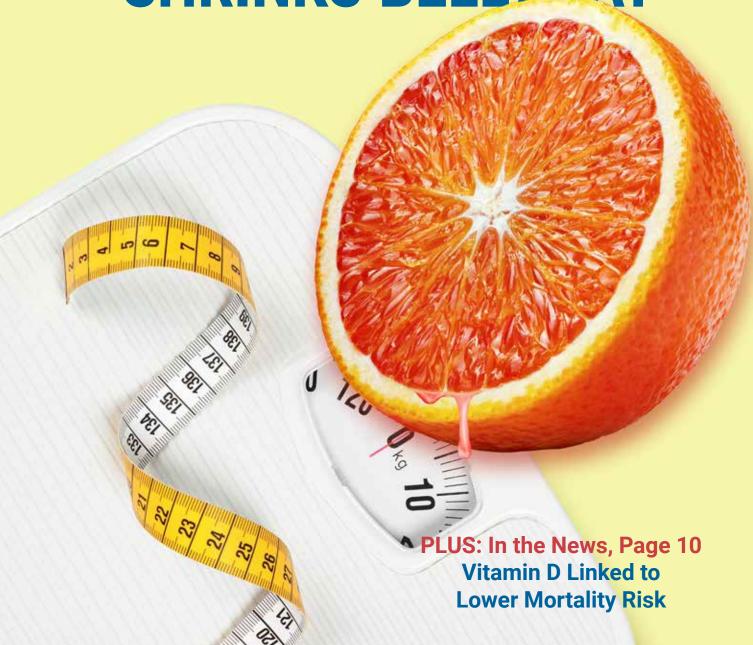


The Science of a Healthier Life®

March/April 2023

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

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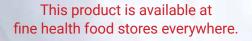






* Int Angiol. 2014 Feb;33(1):20-6.

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- SQUALANE derived from olives and rich in vitamin E
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- 1. J Indian Soc Periodontol. 2011 Jul;15(3):205-9. 2. Br J Dermatol. 2001 Oct;145(4):535-45. 3. J Am Dent Assoc. Jan 2013; 144(1): 21–30. 4. J Clin Periodontol. 1984 Oct;11(9):619-28. 5. Ann Stomatol (Roma). 2011 Mar-Jun; 2(3-4):10-8.

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The Science of a Healthier Life®

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In human trials, a new **moro orange** extract **decreased** waist circumference up to **2.79 inches**.



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Vice President of Sales and Business Development

Carolyn Bouchard • cbouchard@lifeextension.com • 954-202-7685

Circulation & Distribution

Life Extension • 3600 West Commercial Blvd., Ft. Lauderdale, FL 33309 Editorial offices: 954-766-8433 • fax: 954-491-5306

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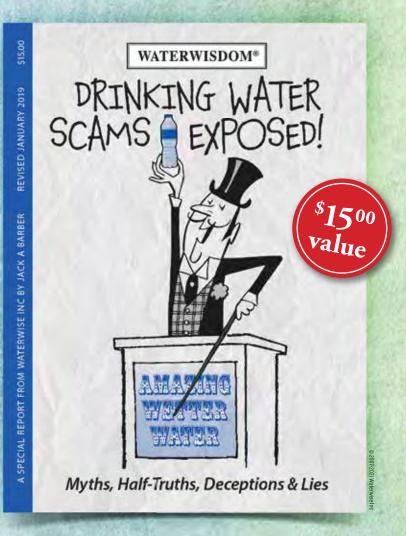
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Gustavo Tovar Baez, MD, operates the Life Extension Clinic in Caracas, Venezuela. He is the first physician in Caracas to specialize in anti-aging medicine.

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

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

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

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

Martin Dayton, MD, D0, practices at the Sunny Isles Medical Center in North Miami Beach, FL. His focus is on nutrition, aging, chelation therapy, holistic medicine, and oxidative medicine.

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

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

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

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

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

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

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

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

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

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

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

Professor Francesco Marotta, MD, PhD, of Montenapoleone Medical Center, Milan, Italy, is a gastroenterologist and nutrigenomics expert with extensive international university experience. He is also a consulting professor at the WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy and honorary resident professor, Nutrition, Texas Women's University. He is the author of more than 130 papers and 400 lectures.

Philip Lee Miller, MD, is founder and medical director of the Los Gatos Longevity Institute in Los Gatos, CA.

Michele G. Morrow, DO, FAAFP, is a board-certified family physician who merges mainstream and alternative medicine using functional medicine concepts, nutrition, and natural approaches.

Filippo Ongaro, MD, is board-certified in antiaging medicine and has worked for many years as flight surgeon at the European Space Agency. He is a pioneer in functional and antiaging medicine in Italy where he also works as a journalist and a writer.

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

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

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

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

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

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

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

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

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

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



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



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



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



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



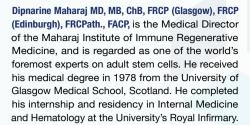
Deborah F. Harding, MD, is founder of the Harding Anti-Aging Center. She is double board-certified in internal medicine and sleep disorder medicine. She also earned the Cenegenics certification in age management medicine. She is a faculty member of the University of Central Florida Medical School.



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



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





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



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



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



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



Xiaoxi Wei, PhD, is a chemist, expert in supramolecular assembly and development of synthetic transmembrane nanopores with distinguished selectivity via biomimetic nanoscience. She has expertise in ion channel function and characterization. She founded X-Therma Inc., a company developing a radical new highway towards non-toxic, hyper-effective antifreeze agents to fight unwanted ice formation in regenerative medicine and reduce mechanical icing.



In the News

Reduced Testosterone Levels Associated with Greater Risk of Cardiovascular Disease

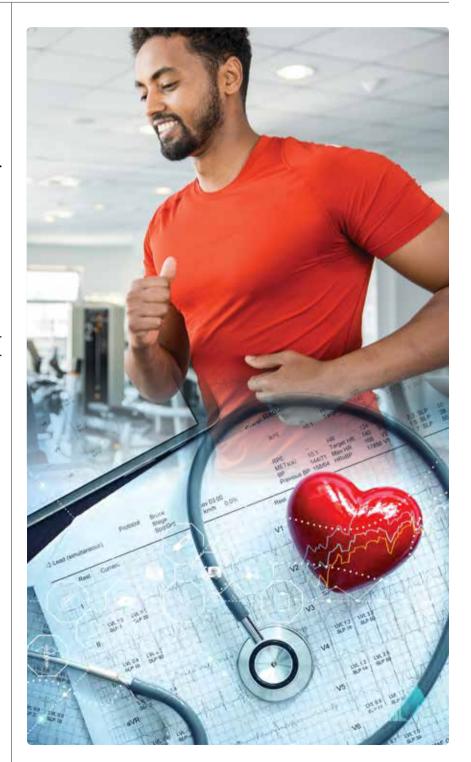
A retrospective cohort study suggests that <u>decreased</u> testosterone levels in young males is associated with <u>increased</u> risk of developing **cardiovascular disease**.*

The investigators used two risk assessment tools to predict the 10-year cardiovascular risk of 1,253 men between the ages of **30** and **79**.

In men aged 30-49, cardiovascular incidence was more pronounced, with a **16**% and **20**% <u>increased</u> risk of disease with <u>low</u> testosterone levels estimated by two risk assessment tools.

Editor's Note: The association between increased cardiovascular risk and <u>low</u> testosterone was consistent in all participants.

* Front Cardiovasc Med. 2022 Apr 14;9:869251.





Improving Vitamin D Levels in Older Age is **Linked to Lower Risk of All-Cause Mortality**

The benefits of correcting and maintaining vitamin D deficiency accrue even in older age, according to the results of a study published in BMC Geriatrics.*

The participants included 1,362 individuals in the Chinese Longitudinal and Health Longevity Survey, aged 60 to 113 whose serum vitamin D levels were measured in 2012 and 2014. Mortality data were collected in 2018. Deficient vitamin D levels were detected among 67.5% of the participants in 2012 and 68.4% in 2014.

During follow-up, 420 deaths occurred. Individuals who were deficient in vitamin D in 2012 and 2014 had more than twice the mortality risk than those who maintained higher levels.

Among participants who maintained sufficient vitamin D or were deficient in 2012 and not deficient in 2014, the risk of dying was 30% and 53% lower, respectively, compared to participants who were deficient at both points in time.

This highlights the need to address vitamin D deficiency in older individuals to support longevity and healthy aging.

Editor's Note: The greatest benefit associated with improved vitamin D status was found among women and those people who were 80 years of age or older, the "oldest old."

* BMC Geriatr 22, 245 (2022).

Omega-3 Fatty Acids Could Improve Immunotherapy

Findings from a study done on mice, reported at the American Society for Investigative Pathology's annual meeting, revealed a benefit for adding omega-3 fatty acids to cancer-fighting immunotherapy.*

The mice were fed either a standard diet, a diet enhanced with omega-3, or a diet high in omega-6, beginning 10 days before injecting them with tumor cells. One week after the injections, the animals were given either immunotherapy, an anti-inflammatory therapy, both therapies, or no therapy.

Compared to a standard diet, the addition of omega-3 fatty acids resulted in more robust response to the treatment compared to the animals that received immunotherapy or immunotherapy plus anti-inflammatory therapy alone.

Mice that received both cancer therapies and the high omega-3 diet had up to 67% less tumor growth than animals that received no cancer therapies and a standard diet.

An omega-6-enhanced diet was associated with significant acceleration of the growth of one tumor type. The typical American diet is loaded with omega-6 fats and deficient in omega-3s.

Editor's Note: Immunotherapy involves

harnessing the body's immune system to combat cancer or other diseases. Supplementation with Omega-3 PUFA may enhance its effect. This combination is predicted to revolutionize cancer therapy.

* Available at: https://www.event scribe.net/2022/EB2022/index. asp?posterTarget=466274. Accessed November 4, 2022



Greater Intake of Vitamins A, C, and E **Associated with Lower Glaucoma Risk**

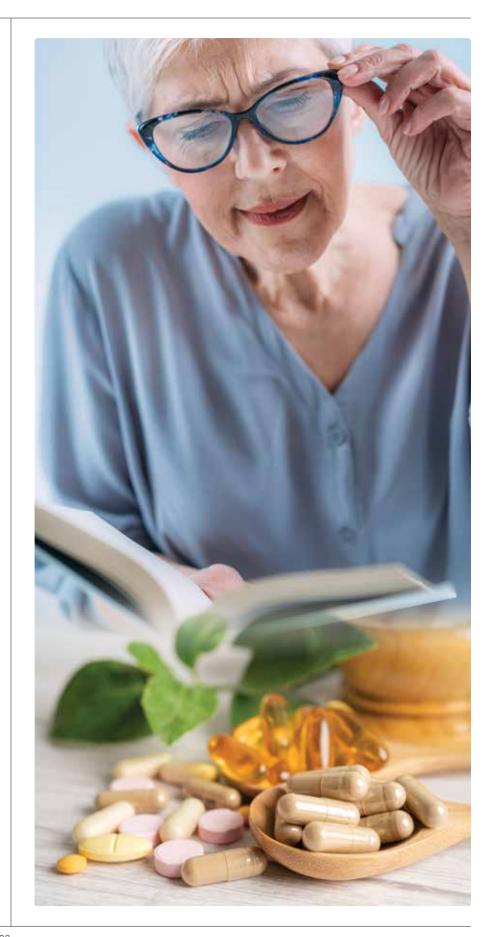
A study presented at the American Academy Ophthalmology Annual Meeting found an association between higher intake of vitamins A, C, and E, and a lower risk of glaucoma.*

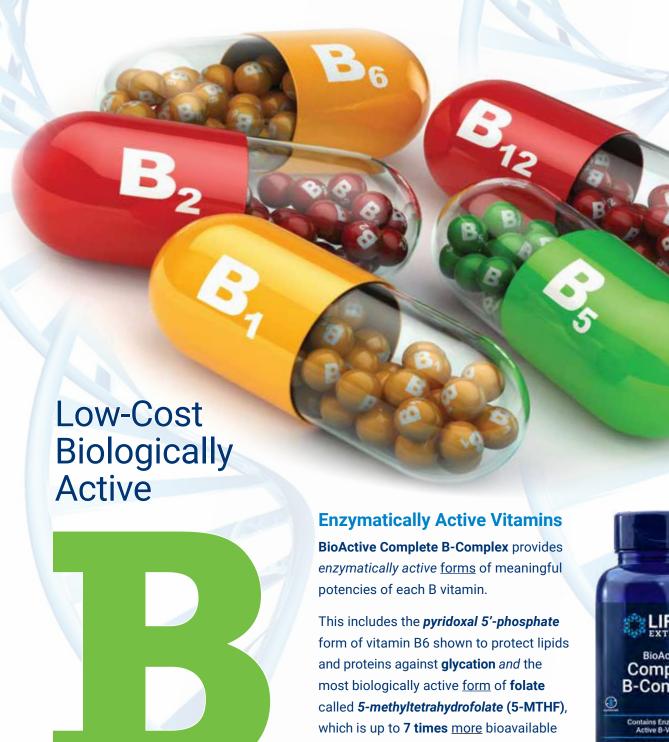
A total of 18,669 participants completed questionnaires every other year, providing information about food and supplement intake, and other factors. During a 12-year average followup, 266 new cases of glaucoma occurred.

Those who consumed high amounts of vitamins A, C, and E during follow- up had an adjusted 47% lower risk of developing glaucoma in comparison with those who consumed low amounts.

Editor's Note: The protective effect was observed only when higher amounts of all three vitamins were consumed in combination.

* Available at: https://www.aao.org/newsroom/news-releases/detail/combinationof-vitamins-may-help-prevent-glaucoma. Accessed Nov. 4, 2022.





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



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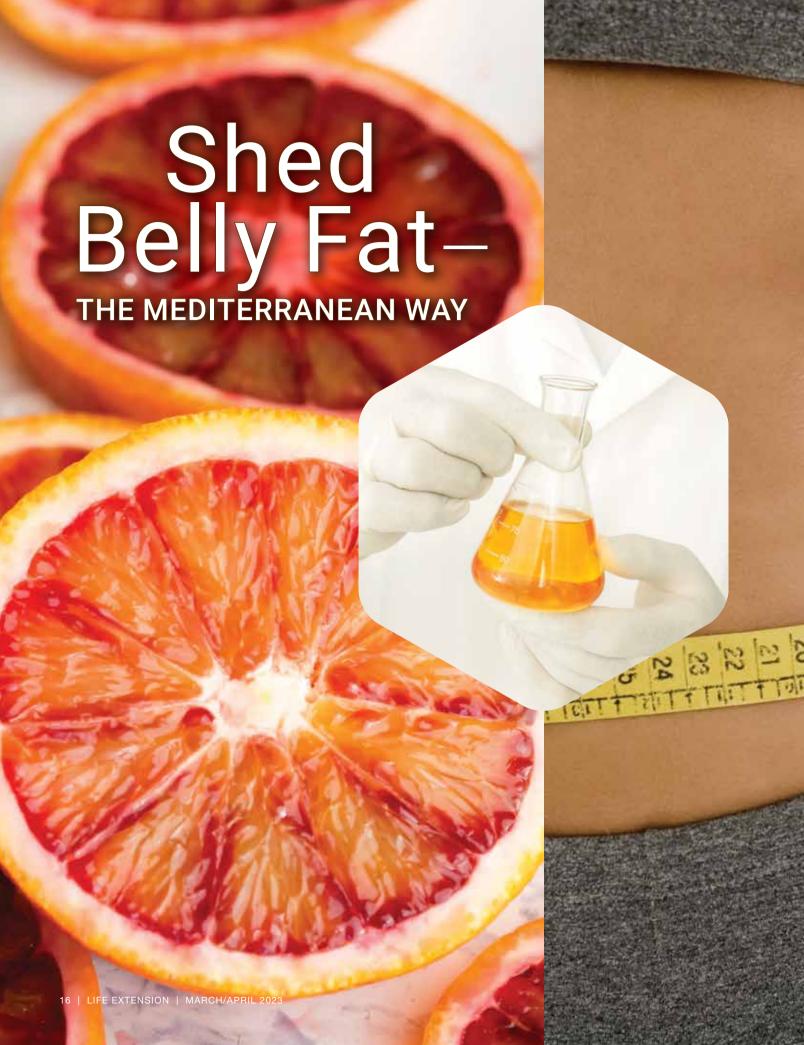
NAD⁺ Cell Regenerator™

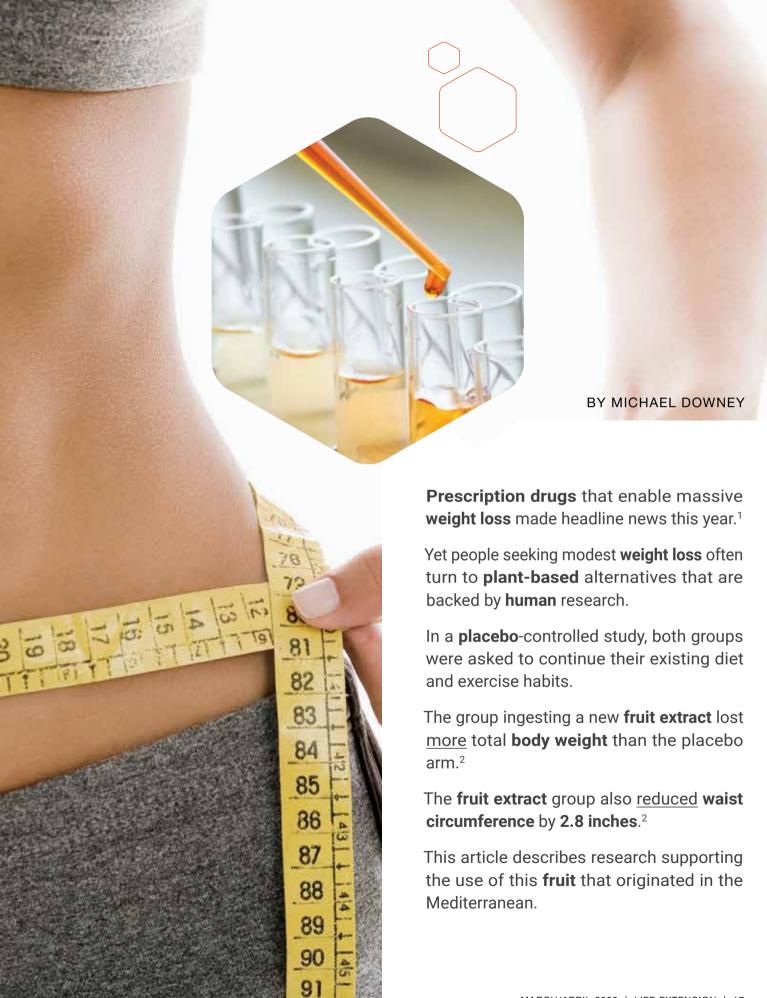
NAD⁺ Cell Regenerator™ Item #02344 30 vegetarian capsules For those already taking resveratrol, we offer NAD+ Cell Regenerator™ that provides 300 mg of nicotinamide riboside.





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92

Dangers of Abdominal Fat

More than 70% of U.S. adults are overweight or obese.3

But not all body fat is the same. Certain types, such as abdominal fat, pose the greatest threat.

Excess body weight around the abdomen, or abdominal obesity, keeps our bodies in an inflammatory state that has been associated with increased risk of metabolic abnormalities.4

A review paper published in the Archives of Medical Science concluded that:4

"Sustained inflammation is considered a strong risk factor for developing many diseases including CVDs [cardiovascular diseases], metabolic syndrome, diabetes, and cancer."

Readers of this publication have been educated for decades about the dangers of chronic inflammation and strategies to combat it.

The "Moro Orange"

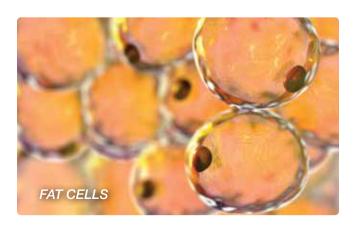
Searching for a way to promote healthy weight loss, scientists have investigated compounds known as anthocyanins.

Evidence from preclinical studies suggests that diets enriched in anthocyanins can improve glucose tolerance and insulin sensitivity.5

Anthoncyanins are pigments found in red, blue, and purple color fruits and in the "moro orange."5

The **moro orange** fruit is believed to have originated at the beginning of the 19th century in Sicily, as a result of a natural bud interaction with another orange type.⁵

Anthocyanins from **moro oranges** have been shown to help decrease weight and adipose tissue (fat) by regulating metabolism of fatty acids.7



One study showed that when healthy, overweight adults supplemented with a moro orange juice extract rich in anthocyanins it resulted in significant reductions in **body mass index** (BMI) compared with taking a placebo.3



Beneficial Compounds in **Moro Orange**

Scientists have concluded that the antiobesity effect of moro orange juice in animal studies is so significant, it cannot be explained by anthocyanin content alone.

Moro orange contains other health-promoting compounds, including:6

- Flavonoids
- Carotenoids
- Hydroxycinnamic acids

These and other **moro orange** components may work together to inhibit fat storage.6

Research on mice demonstrated that intake of moro orange juice:8

- Reduced fat accumulation by about 50%.
- · Decreased adipocyte size, and
- Regulated gene expression of adipose tissue (modulated gene expression changes caused by a high-fat diet).



- Clinical studies show that moro orange extract can reduce weight by an average of 4.2% and decrease dangerous belly fat, when combined with exercise and a reduced-calorie diet.
- Moro orange is high in anthocyanins, which some data have linked to weight loss, along with an array of other beneficial compounds.

Weight Loss in Humans

Scientists set out to assess moro orange's potential for weight loss in humans.

In a clinical study, researchers instructed 60 overweight individuals to take 400 mg of moro orange juice extract once daily. They were also asked to continue with their existing diet and exercise habits.2

Compared to placebo, those who took the moro orange extract for 12 weeks reduced their:

- Weight by 4% (vs. 0.5% with placebo),
- BMI by 1.11 kg/m² (vs. 0.15 kg/m² with placebo),
- Waist circumference by 2.79 inches (vs. 0.31 inches with placebo), and
- Hip circumference by 2.35 inches (vs. 0.27 inches with placebo).

Losing Weight and Fat

For greater validation, a clinical trial was designed that involved 136 overweight but healthy humans, followed for a longer period of six months.9

This time, the volunteers were asked to consume 500 fewer calories daily and walk for 30 minutes, three times a week.

Those who took 400 mg of moro orange extract once daily, on average reduced:9

- Weight by 4.2% (vs. 2.2% with placebo),
- BMI by 1.2 kg/m² (vs. 0.6 kg/m² with placebo),
- Waist circumference by 1.5 inches (vs. 0.7 inches with placebo),
- Fat mass by 7.5% (vs. 5.7% with placebo),
- Abdominal fat mass by 11.3% (vs. 6.1%) with placebo),
- Visceral fat mass (between abdominal organs) by 12.4% (vs. 9.0% with placebo), and
- Subcutaneous fat mass (just under the skin) by 9.4% (vs. 6.4% with placebo).

Overall, 36% of those in the moro orange group had a weight loss of more than 5%, compared to 22.5% of the placebo group.9

To put the waist-size reduction of 1.5 inches into perspective, the notches on a belt are usually about one inch apart, making this a reduction of well more than one belt notch.

Evidence is clear that moro orange extract can be a vital part of a healthy weight-loss program.

Summary

The moro orange has been found to help reduce weight and dangerous abdominal fat.

It is high in anthocyanins and other compounds that may work together to promote weight loss.

Human studies found that more orange extract safely reduced waist circumference by 1.5 to 2.79 inches.

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A 3-month placebo-controlled trial asked participants to continue with their existing diet and exercise habits. Daily ingestion of **400 mg** extract from the **moro orange** produced on average:¹

- Lower waist circumference by 2.79 inches
- Reduced overall weight by 4.0%
- Decreased hip circumference by 2.35 inches

A 6-month placebo-controlled trial asked participants to consume 500 fewer daily calories and walk for 30 minutes, three times a week. The group taking **400 mg** each day of **moro orange extract** produced on average:²

- Lower waist circumference by 1.54 inches—more than one full belt notch
- Decreased abdominal fat by 11.3%
- Reduced overall weight by 4.2%

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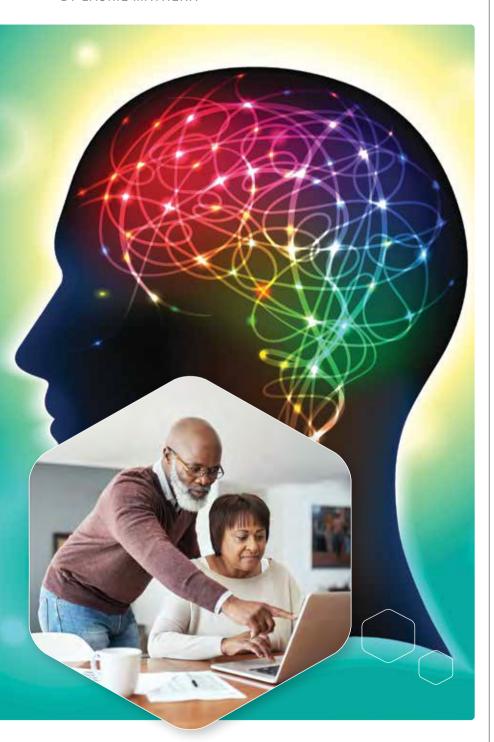
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Increase the "Feel-Good" Neurotransmitter

BY LAURIE MATHENA



Many people accept brain fog, slower brain speed, and lack of motivation as a normal part of aging.

It doesn't have to be.

Cognitive changes can occur due to an <u>increase</u> in an *enzyme* called **MAO-B** (monoamine oxidase B) in the brain.

MAO-B breaks down *dopamine*, a neurotransmitter that is central to many aspects of **cognitive functioning**.¹

Overactivity of MAO-B also produces **toxic compounds** that damage brain cells and contribute to **neurodegenerative** risks.^{1,2}

Research has shown that *inhibiting* MAO-B reduces *cognitive decline*.¹²

In animal studies, lowered MAO-B activity is associated with *increased longevity*.³⁻⁶

Preclinical evidence has revealed that **phellodendron tree bark** is an **inhibitor** of **MAO-B**.⁷

By preserving healthy **dopamine** levels, **phellodendron bark** may help maintain clear thinking, cognitive function, and motivation—while reducing potential risk for neurodegeneration.

What is Dopamine?

Dopamine is a **neurotransmitter** that carries signals—chemical "messages"—between brain cells.¹

It is sometimes called the "feel-good" neurotransmitter. It also plays a role in various aspects of **cognitive functioning**, including attention, motivation, and movement.^{8,9}

The levels of **dopamine** decline by about **13%** each decade after age 45.¹⁰ A meta-analysis of 95 studies including 2,611 healthy adults concluded that activity in the brain's dopamine system decreases by an average of **3.7%–14.0%** per decade age.¹¹

<u>Low</u> dopamine levels are associated with depression, lack of motivation and pleasure, and symptoms of drug withdrawal.^{2,8}

Loss of dopamine function has also been shown to play a major role in the development of some neurodegenerative diseases.¹²

How MAO-B Overactivity Damages the Brain

One potential underlying cause of low brain dopamine levels is an increase in the enzyme **MAO-B**, which breaks down dopamine.¹

MAO-B activity *increases* in the brain as we age.¹³

As MAO-B increases, highly toxic byproducts are formed that can damage brain cells.² This damage has been linked to brain deterioration and development of age-related neurodegenerative diseases, including **Parkinson's** and **Alzheimer's**.

Researchers have hypothesized that when MAO-B activity is **normal**, these toxic byproducts are largely neutralized by antioxidant defenses.^{2,13,14}

Inhibiting MAO-B overactivity prevents some of the breakdown of dopamine that occurs with aging. The dopamine system is complex, including not only dopamine levels but also multiple types of dopamine receptors and transporters, all of which vary across different brain regions.¹¹

Phellodendron Inhibits MAO-B

Scientists have identified, in preclinical models, **phellodendron tree bark** as one of the strongest and most selective plant-derived **MAO-B inhibitors**.^{7,15}

One study found that **phelloden-dron** inhibited activity up to **5.6-fold**. This is comparable to **deprenyl**, an MAO-B-inhibiting drug used to treat Parkinson's and depression.⁷

The ability of **phellodendron** to inhibit MAO-B means it has the potential to maintain dopamine levels *and* block the neurotoxic effects of the enzyme's overactivity.

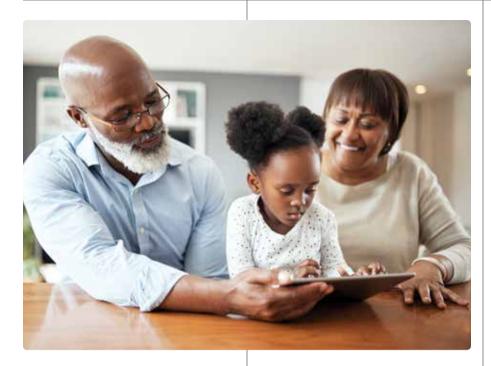
Phellodendron Protects Cognitive Function

Phellodendron has **neuroprotective** properties that go beyond MAO-B inhibition. 16-18

In one cell model of **Alzheimer's disease**, phellodendron extract protected against **beta-amyloid toxic-ity**,¹⁷ which is commonly seen in the brains of people with Alzheimer's.

In a rodent model, phellodendron protected against **neuroinflammation**, amyloid production, and other changes associated with Alzheimer's. 18,19





In humans, these mechanisms could help maintain **cognitive function** into older age.

Summary

With age, overactivity of the enzyme **MAO-B** occurs in the brain.

This may result in *reduced* levels of the critical neurotransmitter **dopamine**.

MAO-B also produces toxic compounds that damage brain cells and contribute to the risk for neurodegenerative diseases.

Phellodendron bark extract can *inhibit* MAO-B activity.

This may help maintain **dopamine levels** and prevent the neurotoxicity associated with MAO-B overactivity. Studies also show that phellodendron has other **neuroprotective** properties.

Those who take MAO-B-inhibiting drugs like **deprenyl** do <u>not</u> need to take **phellodendron**. Phellodendron is not a substitute for physician-prescribed medications. •

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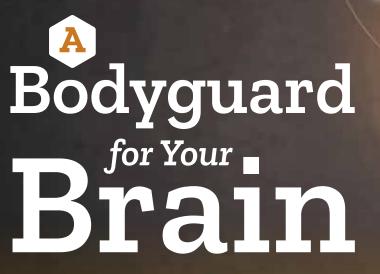
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*European Journal of Nutrition. 2011;50(5):387-389.







neurotransmitter, regulates motivation, mood, movement, and cognitive function.

With age, dopamine levels decline due to the increase of the MAO-B enzyme.

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Feel Better FASTER During COLDS & FLU

BY MICHAEL DOWNEY

Colds and flu can make anyone miserable.

They pose a particular risk to **older adults**, who have reduced **immune** responses.^{1,2}

Human studies show that <u>three</u> nutrients, taken in the *early* stages of a cold or flu, can activate **immune** functions to *change the* course of the illness.³⁻⁶

These nutrients can reduce the **duration** and **severity** of the cold or flu, making people feel better faster and decreasing the danger to older adults.

Protection Against Colds and Flu

Over **one billion colds** occur in the U.S. each year,⁷ typically lasting about seven days.⁸

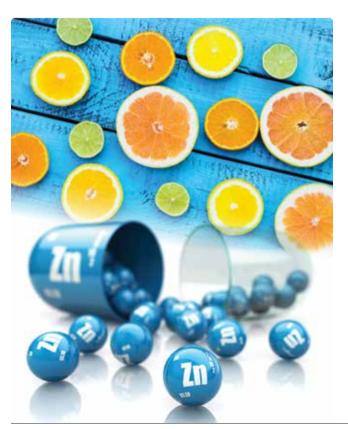
Up to **20**% of Americans contract the **flu** each year, which can lead to sometimes-fatal complications including **pneumonia**—particularly in older adults.⁷

Flu vaccines don't protect against **colds**⁷ and don't even protect against all the strains of **flu** virus.⁹

In human studies, scientists have demonstrated that **elderberry**, **zinc**, and **vitamin C** can help target respiratory infections:³⁻⁶

- Elderberry extract was shown to resolve upper respiratory symptoms up to four days earlier than a placebo,^{4,5}
- Zinc lozenges were found to reduce duration of colds by up to 44% and severity of symptoms by as much as 50% when initiated soon after symptoms appear,³ and
- Vitamin C reduced duration of colds by 9.4% overall and by 18% in children.⁶

Supplementation should be started as soon as possible after symptoms begin.^{3,4,6,10} This strategy applies to <u>all</u> approaches including anti-viral flu drugs such as Xofluza® to get people back on their feet quickly.¹¹



Elderberry

Elderberries contain anthocyanins, which are plant pigments that have demonstrated immunomodulating, antioxidant, antiviral, and anti-inflammatory effects. ^{5,12,13}

Elderberries' **antiviral** effects have been shown in two major reports:

- A systematic review of previous studies published in 2021 found that elderberry extract may safely reduce the duration of flu and cold infections and reduce the severity of colds.⁵
- An earlier meta-analysis of clinical trials showed that elderberry extract can significantly reduce the duration of illness in people with flu or cold infections.¹²

Cell culture studies found that **elderberry** and its extract had direct antiviral effects against **viral respiratory tract infections** such as colds and flu.

In high (in vitro) doses, *nearly 100*% of cells were protected against infection.^{14,15} The positive outcomes were observed even in the virulent form of flu virus that caused the **1918** Spanish flu pandemic **(H1N1).**¹⁵

Later studies demonstrated similar effects in humans. In one, people suffering from upper respiratory symptoms who used elderberry extract had their symptoms resolve four days earlier than those taking a placebo.⁴

Zinc

Zinc is critical to maintaining **immune system** strength. It helps with normal development and function of key immune components, including:¹⁶

- Natural killer cells, which kill virally infected cells and tumor cells,
- Lymphocytes, which produce antibodies and help control immune responses,
- Neutrophils, which travel to infection sites and ingest bacteria or viruses, and
- Macrophages, which surround and kill harmful microorganisms.

Zinc deficiency is common among the elderly.^{17,18} Data show that oral intake of zinc by the elderly boosts the stress response of **white blood cells**, enhancing immune response.¹⁹

Zinc also seems to **coat the receptors** that **viruses** use to bind to cells. This means that viruses may be kept out of body cells, effectively **blocking** them from replicating out of control.²⁰

A meta-analysis of clinical trials evaluated the effects of taking more than **75 mg** of zinc per day, in the form of **zinc acetate lozenges** every few hours throughout the day, starting after the first sign of symptoms. Results of this analysis showed:

- Reduced duration of various cold symptoms by between 18% to 54%, and
- Colds themselves were reduced in duration by 42%.

Vitamin C

Vitamin C enhances growth and survival of infection-fighting **immune cells** by:²¹⁻²³

- Helping to increase levels of antibody-producing lymphocytes,
- Boosting function of infection-engulfing neutrophils, and
- Supporting natural killer cell activity.

Scientists have also demonstrated broader immune benefits of **vitamin C**, including:^{23,24}

- Neutralization of excess free radicals caused by the immune system's fight against infectious organisms,²³
- Preclinically, increased interferons have been demonstrated; these are chemical signaling molecules the body produces to trigger immune mechanisms,²³
- Support for production of collagen, the protein that helps respiratory and digestive tract linings maintain an anti-infection barrier,²⁴ and
- Reduction of histamine, a pro-inflammatory compound that plays a role in infections and allergy symptoms.²⁴

A large review paper on **vitamin C** and infections found that vitamin C <u>reduced</u> **duration** of colds by **9.4%** on average (**8%** in adults, **18%** in children).⁶



Strengthen Your Immune System— Fast

- Respiratory infections, such as colds and flu, have the potential to be lifethreatening for aging people.
- Research has found that zinc, elderberry, and vitamin C help support the immune system and can reduce the severity and duration of colds and flu when taken at the first sign of symptoms.
- **Zinc** lozenges have been shown to reduce duration of colds by an average of **42**%.
- Elderberry extract helps resolve upper respiratory symptoms up to four days earlier than a placebo.
- Vitamin C has been shown to reduce duration of colds by an average of 9.4% overall and by 18% in children.

Other studies have found that vitamin C reduces duration^{6,25,26} and incidence²⁷⁻²⁹ of colds. Some evidence has suggested greater benefit with higher doses and if intake begins right after symptom onset.8

The human body cannot produce or effectively store vitamin C. So, levels should be replenished daily.30

In an analysis of two clinical trials scientists found that a combination of 1,000 mg vitamin C plus 10 mg zinc over five days of treatment, was more efficient in reducing symptoms of cold than a placebo.31 This may indicate the importance of a multi-nutrient strategy.

Along with **elderberry** and **zinc**, **vitamin** C can provide important immune support.

Summary

Colds and flu can pose a substantial risk to older adults due to age-related immune decline.

Clinical studies demonstrate that, when taken for a short course at the first sign of symptoms, elderberry, zinc, and vitamin C can support the immune functions and reduce the severity and duration of certain viral infections •

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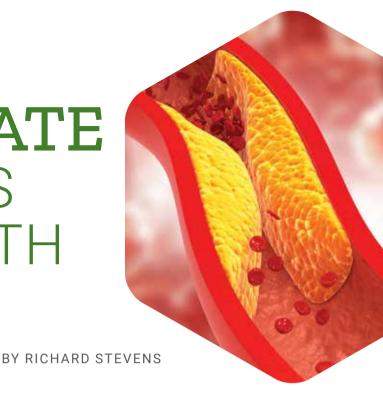
BLACK ELDERBERRY + VITAMIN C

Immune Support





HOW POMEGRANATE PROMOTES HEART HEALTH



Pomegranate is a nutrient-dense food with compounds that promote **heart health**. 1-4

Preclinical and clinical studies show that pomegranate can improve blood flow,^{6,7} reduce arterial blood clots,⁵ and modestly lower cholesterol, triglycerides, and blood pressure.⁸

Most notably, pomegranate has been shown to help prevent and even reverse some of the blood vessel damage that can lead to **heart** attack and stroke. 1,2,9,10

A clinical study in patients with **atherosclerosis** found that **pomegranate** consumption substantially decreased thickness of **carotid artery** plaques.⁹

Fresh pomegranate fruit or juice can be high in fructose.¹¹ For those who want to avoid the sugar, **pomegranate extracts** provide an alternative.

A Nutritional Powerhouse

All parts of the pomegranate plant, including the fruit, leaves, peel, seeds, and flowers, are packed with beneficial compounds.

These include anthocyanins, flavonoids, and unique tannins (such as punicalagin).2

One of pomegranate's most impressive effects is its ability to protect aging arteries in multiple ways. including preventing and even reversing endothelial dvsfunction.1,2

Endothelial dysfunction refers to damage to the delicate inner lining of blood vessels. This dysfunction is an important contributor to atherosclerosis, the buildup of plaque in the arteries. 10,12

Atherosclerosis is responsible for a major share of deaths worldwide. 13,14

Improving Lipid Levels

Animal models have shown that **pomegranate** can reduce blood levels of total cholesterol, LDL cholesterol, and triglycerides. 15-18

Oxidation of LDL cholesterol makes it more dangerous than normal LDL. Oxidized LDL accumulates in blood vessel walls more easily and accelerates the progression of atherosclerosis. Pomegranate decreases the oxidation of lipids. 19,20

In **human** studies, pomegranate use significantly reduces blood levels of oxidized LDL and reduces LDL aggregation. 19,21

Restoring Blood Vessel Function

An important indicator of endothelial dysfunction is an impaired ability of blood vessels to dilate (widen) when necessary. 10,22

Pomegranate and its extracts improve the ability of the endothelium to promote arterial relaxation and dilation.6,7

Nitric oxide is one of the body's main vasodilators, which means it induces the dilation of arteries.

In endothelial dysfunction, production of nitric oxide declines. Preclinical evidence shows that pomegranate can boost nitric oxide production and improve arterial dilation.23-26

Preventing Blood Clots

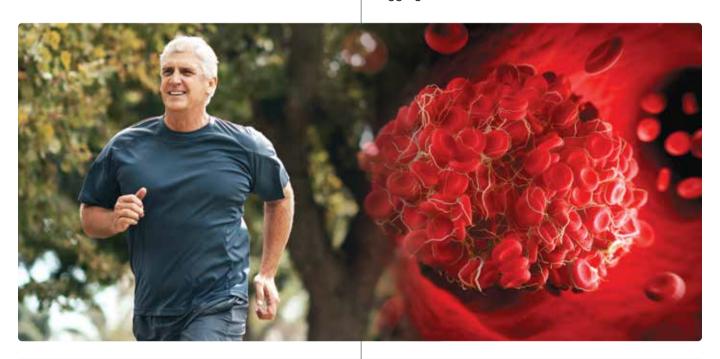
Endothelial dysfunction and atherosclerosis increase the risk of abnormal blood clots.

Most heart attacks and strokes are caused by clots forming inside diseased arteries, which reduces blood flow to the heart or brain.27,28

Some of the same compounds contained in pomegranate that benefit arterial health also influence the function of platelets, the tiny cells in our blood that form clots.

Thromboxane A2, which is *reduced* by pomegranate, activates platelets and causes their aggregation.^{29,30}

In animal studies, pomegranate reduced clotting associated with platelets and other factors, even when exposed to stimuli that would normally cause their aggregation.5,29



Improving Blood Pressure

High **blood pressure** is a major risk factor for atherosclerosis and is closely linked with endothelial dysfunction.³¹⁻³³

A class of drug used to lower blood pressure are the **ACE inhibitors**.

Preclinical and clinical research has demonstrated that, like these medications, pomegranate extracts can *inhibit* ACE activity.^{34,35} In fact, multiple clinical studies show that pomegranate is able to help reduce elevated blood pressure.⁸

In people with **high blood pressure**, two weeks of pomegranate intake decreased blood ACE activity by **36%**. In this study, pomegranate lowered systolic blood pressure by **5%**. ³⁵

In other human studies, pomegranate consumption led to reductions in **systolic** and **diastolic** blood pressure.^{8,36,37}

In a study of subjects with **atherosclerosis** in the carotid artery, one year of pomegranate intake reduced **systolic blood pressure** by an average of **12%**.⁹

Those with **systolic blood pressure** levels chronically above **115-120 mmHg** should seek professional guidance on the appropriate medication and/or lifestyle intervention (such as weight loss) to safely achieve **optimal** blood pressure control.

Blood Glucose

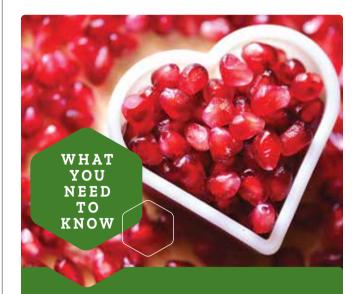
Poor control of **blood glucose** levels is a powerful contributor to both endothelial dysfunction and to atherosclerosis.¹

In animal studies, **pomegranate extract** improved **insulin sensitivity** and reduced **fasting blood glucose** levels.^{38,39}

In studies of patients with **type** II **diabetes** or impaired glucose control, a single dose of pomegranate improved insulin sensitivity and blood glucose control.^{40,41}

Pomegranate may also protect against the damage that glucose causes to tissues, including arteries. A large part of this damage is due to **glycation**, when sugars bind to proteins and alter their function.⁴²

Punicalagin from pomegranate has been shown preclinically to *suppress* the **glycation** of proteins and prevent their accumulation, even in mice fed a **high-sugar** diet.⁴³



Pomegranate Improves Endothelial Health

- **Heart disease** is the most common cause of death worldwide.
- Endothelial dysfunction, damage to the layer of cells lining the inside of arteries, is closely linked to atherosclerosis and risk for cardiovascular disease.
- Pomegranate and its extracts contain many free-radical quenchers and anti-inflammatory nutrients that can shield against a wide range of chronic age-related cardiovascular risks.
- Many of the health benefits of pomegranate are related specifically to blood vessel health, reducing the progression of endothelial dysfunction and atherosclerosis in animal and human studies. This reduces the risk of developing cardiovascular disease.
- Even in subjects already experiencing signs of **heart disease**, pomegranate intake has been shown to reduce symptoms.

Those with less-than-optimal glycemic markers (glucose + A1C + fasting insulin) despite healthy diet and lifestyle should seek professional guidance on a range of medications that can lower excess blood sugar.

Reducing Atherosclerotic Plagues

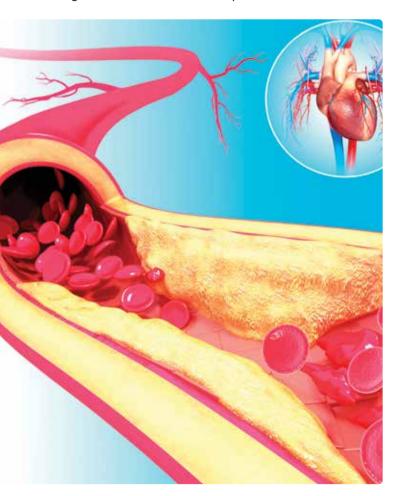
Pomegranate has a profound impact on blood vessel health.

In preclinical investigations, punicalagin and pomegranate extract have both been shown to help reverse endothelial dysfunction.44,45

Animal models of accelerated atherosclerosis also show that pomegranate can prevent and reverse the progression of atherosclerotic plaque.

For example, rodent studies show that pomegranate helped maintain arterial health and significantly slowed progression of atherosclerosis. 46,47 In a mouse study, pomegranate reduced the size of plaques bv 44%.21

Human trials have found striking effects on improving cardiovascular disease parameters.



One clinical study evaluated patients with atherosclerosis in the carotid arteries.9 Pomegranate consumption decreased the extent of atherosclerotic plaque by up to 35% after a year. Those who did not receive pomegranate had a 9% worsening of atherosclerosis.

In adults with ischemic heart disease (insufficient oxygen delivery and blood flow to the heart muscle), pomegranate significantly reduced the intensity, occurrence, and duration of angina (chest pain) episodes.48 lt also lowered the level of troponin in the blood, an acute marker of damage to the heart muscle.

Another study in patients with heart disease found that while exercise-induced ischemia (reduced blood flow) of the heart increased in a control group over three months, patients receiving pomegranate juice had a significant ischemia decrease.49

These studies and others make it clear that pomegranate can help reduce risks for atherosclerosis and symptoms of heart damage in those with existing cardiac issues.

Summary

Pomegranate and its extracts have demonstrated abilities to prevent and reverse endothelial dysfunction, a blood vessel malfunction that contributes to atherosclerosis.

Pomegranate also improves blood pressure, glucose, lipid status, and abnormal clotting.

Through all these actions, pomegranate may reduce the risk of developing cardiovascular disorders and relieve symptoms in people with preexisting heart disease.

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Endothelial Defense[™] helps protect the inner linings of your **arteries** with:

- Pomegranate polyphenols extracted from the fruit, flower, and seed
- SOD (superoxide dismutase promoter) from melon (Extramel®)
- Cardiose® hesperetin extracted from sweet orange peels.

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



AGE-REVERSAL UPDATE

Highlights from 2021-2022

By William Faloon Slides Designed By Chase Falcon

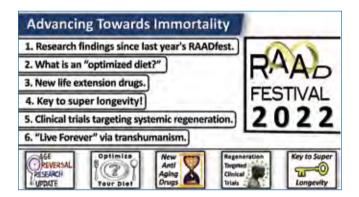
In October 2022, I gave the keynote talk to open a 4-day event where physicians and scientists presented findings on combatting **biological aging**.

My presentation was limited to 55-minutes.

I could have taken the entire day based on the abundance of new data to report.

I opened my talk by stating that there had been <u>more</u> advances in the fields of **age-delay** and **age-reversal** over the prior 12 months than in *any* one-year period in human history.

This article summarizes highlights of my presentation at the **Revolution Against Aging and Death** (RAADfest) conference held in San Diego on October 6-9, 2022.



Mainstream Media Coverage

The science of age reversal continues to garner favorable media coverage.

I presented a few of the many news outlets' reports on **regenerative medicine** advances including:

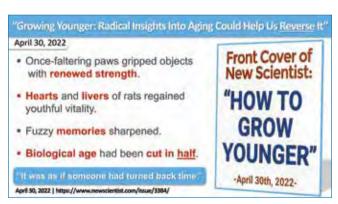
CBS News: Can we reset our biological clocks?

New Scientist: How to GROW YOUNGER

New York Times: Can a Magic Protein

Slow the Aging Process?







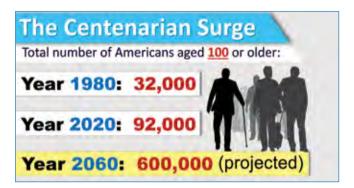
A Biological Renaissance

We are in the midst of a **biomedical renaissance** whereby human life spans are markedly improving.

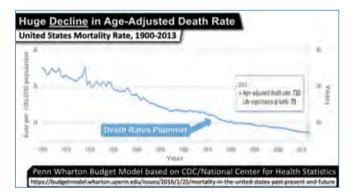
As with the **European Renaissance**, few people today understand the magnitude of the scientific gains.

Nearly 3 times <u>more</u> Americans were alive aged 100 and older in 2020 compared to 1980.

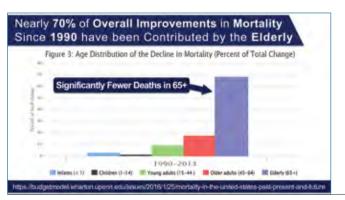
The number of American centenarians is expected to surge **7-fold** *higher* by **2060**.



The **age-adjusted** death rate has plummeted. This means the <u>increase</u> in **centenarians** is not only due to more people, but that **older people** are **living** *longer*.



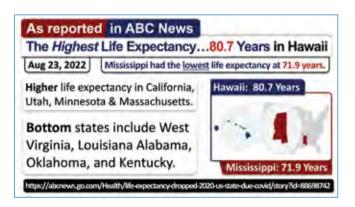
And since year **1990**, nearly **70%** of mortality reductions have occurred in Americans <u>over</u> **age 65**. This reflects significant longevity gains in older segments of the American population. (Which includes a lot of our readers including me!)



Where you Live Determines How Long You May Live

I displayed a map showing a nearly **9-year disparity** in life expectancy between **Mississippi** and **Hawaii**.

I pointed out that people living in states where **healthier lifestyles** are practiced enjoy *longer* disease-free lifespans.



Much of this longevity disparity is attributable to dietary differences. I listed toxic foods to avoid on the next slide.



I present this list of **toxic foods** during many of my talks to reinforce healthier dietary practices.

Billionaires <u>and</u> Government Fund Age-Reversal Research

In **January 2022**, the *largest* **age-reversal** project in history was announced, with **\$3 billion** committed by billionaires (like Jeff Bezos and Peter Thiel) and the **National Institutes of Aging**.

This is a venture between the **federal government** and the **ultra-wealthy** seeking methods to delay and **reverse** aging!



Five months later (June 2022), **MIT** announced the Saudi Royal Family has started a nonprofit group that plans to spend up to \$1 billion a year to do "research on the biology of aging and find ways to extend the number of years people live in good health."

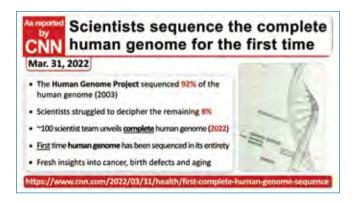


Human Genome 100% Sequenced

In **2003**, scientists sequenced **92%** of the **human** genome. This caused the lay public to think the <u>entire</u> human genome had been sequenced.

In **March 2022**, scientists annouced that **100%** of the **human genome** had been sequenced.

That means the gene editing therapies being studied now (such as **CRISPR**) may be used to combat virtually every disease, including **aging** itself.



Human Trial using CRISPR Gene Therapy

A **monkey** trial published in **May 2021** showed a single **CRISPR** gene therapy injection <u>lowered</u> cholesterol by **60%** and kept it low. This same research transitioned into a **human** trial that initiated studies in **July 2022**—only a **14-month** gap between <u>primate</u> and human research!

Historically, it has taken much *longer* to transition successful animal research into clinical trials.



CRISPR technology has even advanced to the point of engineering stronger **immune T-cells** to kill <u>more</u> tumor cells as reported in **August 2022**. This might help enable aging humans to escape the lethal impact of **immune senescence**.

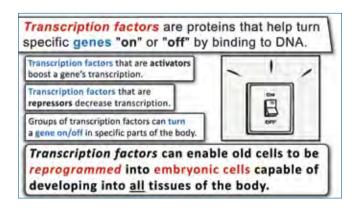


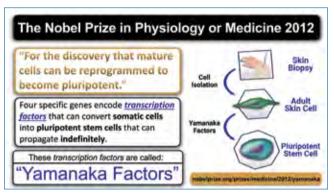
Age Reversal in Live Mice

As researcher's zero in on rejuvenation strategies, a promising near-term solution is to use "*transcription factors*" to turn "on" pro-youth **genes** and turn "off" senescent-inducing genes.

Transcription factors **reprogram** the **genes** of old cells, so the old cells can transform into **young** cells.

The two slides on the next page help further explain "transcription factors".





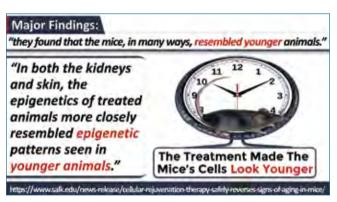
On March 7, 2022, the world awoke to an unprecedented announcement from the **SALK Institute**. Salk scientists had safely and effectively reversed the aging process in live mice by using transcription factors.

This generated headline news stories worldwide including Jimmy Fallon of The Tonight Show reporting that scientists had succeeded in "reversing the aging process by making cells young again."

The following three slides provide highlights to describe how Yamanaka transcription factors were used to reverse aging in live mice.







Rewriting the Rules of Biology

Time-honored doctrine is that **cell aging** is irreversible and that old cells eventually degenerate and die.

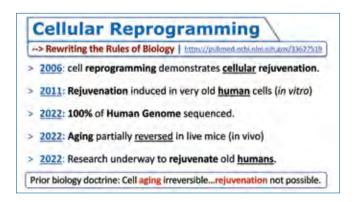
In 2006, that theory was turned upside down with the demonstration of in vitro cell rejuvenation.

In 2011, cells from a 100-year human were rejuvenated back to youth.

In 2022, a similar technique (using Yamanaka transcription factors) was used to partially reverse aging in live animals.

Human trials are now being pursued.

The box below shows the timeline in the development of cellular reprogramming using transcription factors.

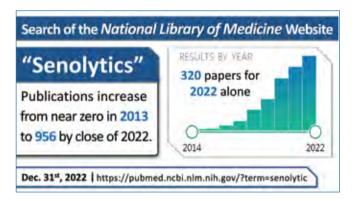


Reducing the Senescent Cell Burden

For my keynote presentation, I planned on showing many new slides about **senolytics** (compounds that remove toxic **senescent cells** from the body).

Realizing there was insufficient time, I showed a chart from the **National Library of Medicine** that revealed near <u>zero</u> published papers about **senolytics** in **2013** and over **800** by mid-2022.

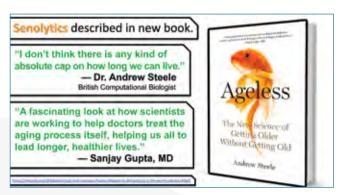
The chart below is updated to reflect <u>all</u> published studies that mention **senolytics** in **2022**.



A vaccine is being investigated that may enable one's aged immune system to remove senescent cells, thus eliminating the need for senolytic compounds.



A book published in **2022** called "**Ageless**" described ways to achieve super-longevity including using senolytics. **Sanjay Gupta, M.D.** gave it a nice endorsement.



Intermittent Fasting

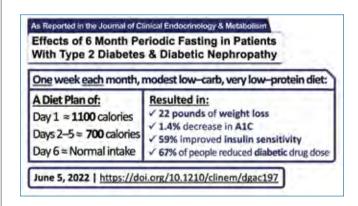
Studies evaluating the broad-spectrum benefits of various forms of **time-restricted eating** continue to be largely consistent.

The potential value of intermittent fasting in cancer prevention is being continually corroborated as well as its role as possible adjuvant treatment.





Another study provided further validation of the general benefits of a fasting-mimicking diet in demonstrating significant **weight loss** and improvements in glycemic (diabetic) blood markers.

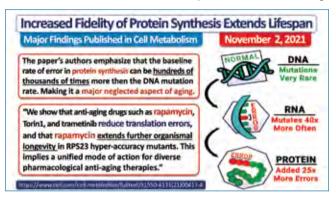


Rapamycin

Several speakers presented the potential longevity benefits of rapamycin, a drug that has extended lifespan in virtually every model tested.

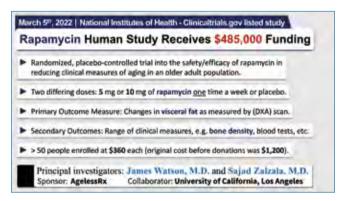
I focused on a newly identified mechanism of rapamycin, which is to reduce the error rate of cellular protein synthesis that occurs with normal aging.

The box below describes the importance of this finding.



Two rapamycin clinical trials were described with results expected soon on the first of two human studies announced.

The primary outcome for the first study evaluates changes in visceral fat in response to weekly rapamycin doses of 5 mg or 10 mg. Secondary measures will assess bone density and other aging measures using blood tests as shown on the slide below.

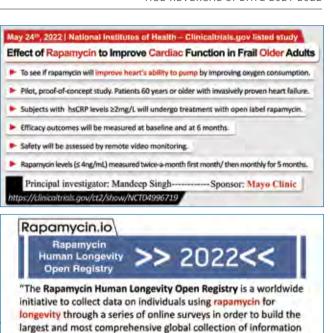


The second study being conducted at the Mayo Clinic will assess the effects of rapamycin on cardiac function in frail older adults.

Two registries have been established to enable people self-experimenting with rapamycin to report the benefits and any side effects they may be encountering.

The first slide on the next column describes a Mayo Clinic clinical trial that measures cardiac function effects of rapamycin given to frail older people.

The next two slides on the right side column describe the rapamycin registries.



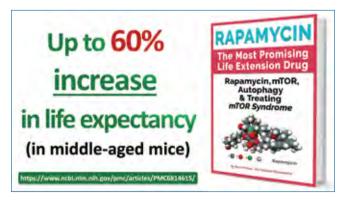


on this topic to date. It is the first online patient-driven registry for rapamycin usage, with individuals taking the drug driving the

collection of data."

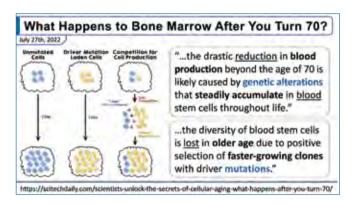
A book about rapamycin was published in 2022 and serves as a primer for those not familiar with data showing that rapamycin extends lifespan in virtually every species tested.

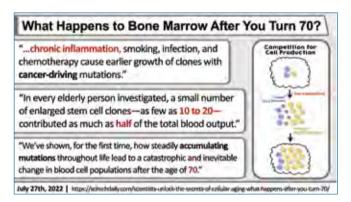
The book (item #34189) costs \$14.95 and can be ordered by calling 1-800-544-4440 or logging on to www.LifeExtension.com



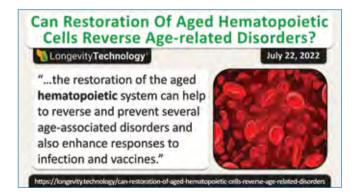
Rejuvenating Aged Bone Marrow

Grim findings about what happens to bone marrow **stem cells** as we age are outlined on the following two slides. They were <u>not</u> shown during my time-limited talk at RAADfest.





I then revealed encouraging news about what scientists are doing to combat loss of youthful **stem cell function** in aged **bone marrow**.

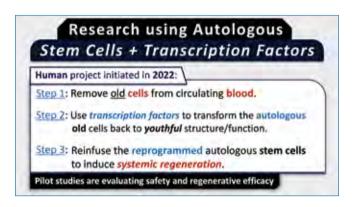


I presented a **2022** study (top of next column) showing that infusion of bone marrow (hematopoietic) **stem cells** into mice with sepsis markedly improved survival.

This approach is not yet available for **sepsis** patients, but research is being planned to help rejuvenate aged **human** bone marrow.



I next described human research initiatives that aim to regenerate human aged **hematopoietic** and **mesenchymal** stem cells with the objective of inducing **systemic rejuvenation**.

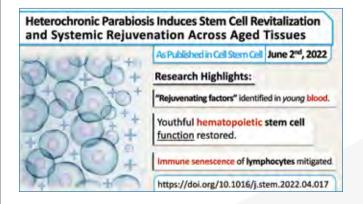


Regenerative Effects of Young Plasma

When **young blood** is continuously circulated into **old rodents** (parabiosis), multiple regenerative effects occur, and lifespans are often lengthened (as much as 10-12 human equivalent years).

One aspect of aging that **young blood** had <u>not</u> shown to improve was **immune senescence**.

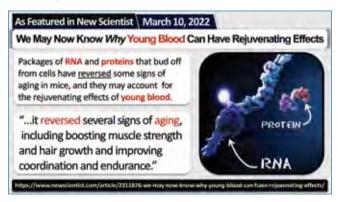
A **2022** study demonstrated for the first time restoration of **hematopoietic stem cell** <u>function</u> in response to parabiosis (young blood) therapy in rodents.



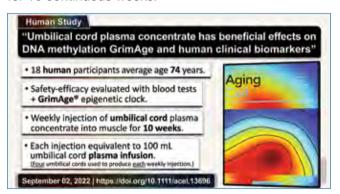
Continuously circulating *young blood* into old people is not practical.

What scientists have been doing is identifying factors in young blood that induce rejuvenation in older animals.

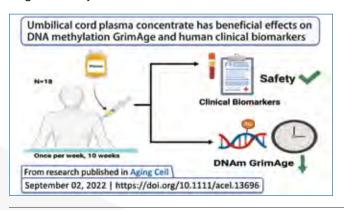
The beneficial microRNA and other proteins from *young* blood cells can then be synthesized to make them widely available to **reverse aging** processes in maturing **humans**.



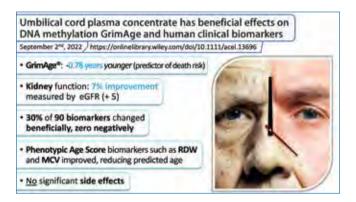
I next presented a study published in **September 2022** that I helped to fund. A concentrate from <u>human</u> **umbilical cord plasma** was injected into older people for 10 continuous weeks.



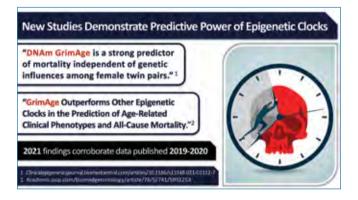
The objective of these studies is to identify the safety/efficacy of very young (umbilical cord) plasma and then synthesize the regenerative factors so that <u>all</u> elderly people will someday be able to enjoy varying degrees of rejuvenation.



This pilot study showed indicators of **age-reversal** after only 10-weeks of administrating the concentrate derived from **umbilical cord** plasma.



For those not familiar with a blood test that measures biological aging, I created a slide (on this page) showing the predictive power of a test called **DNAm Grim Age**. This is currently an expensive test only available to researchers, but I explained later how one can obtain surrogate results at no charge with basic **blood tests**.



The Betterhumans Research Group

A nonprofit group (Betterhumans.org) that I help fund is making remarkable progress.

They have a team of scientists working around the clock to validate practical methods that elderly people can utilize to **reverse** indices of degenerative aging.

I encourage those with the wherewithal to make tax-deductible donations to contribute to <u>Betterhumans</u>. <u>org</u> group so they can can initiate more age-reversal clinical research.

The slide at the top of the next column shows construction of Betterhumans new research facility.

The Betterhumans building you see on the next page is nearly finished now (beginning of 2023).



Therapeutic Plasma Exchange

Another method being studied to control aging is to undergo a process called "plasma apheresis" which is used in clinical practice today for autoimmune disorders.

On the main RAADfest stage, Dr. Kiprov acknowledged the recruitment campaign I organized to find study subjects for his ambitious clinial trial. The treatment is called Therapeutic Plasma Exchange.



Dr. Dobri Kiprov's research group (Lyfspn) is working with the prestigious Buck Institute on a study in which older people will undergo one of three different apheresis protocols to remove senile plasma proteins and replace them with fresh, healthy albumin plus immunoglobulins.



Offshore Medical Practices

A growing number of medical facilities are being established in Nassau, Bahamas due to its proximity to the United States and longstanding relationships that U.S. physician/scientists have maintained with their Bahamian counterparts.



The next slide on this page is a compound (former U.S. Consulate office of sorts) that the Age-Reversal Network group leased. It serves as a staging ground to plan potential age-reversal medical opportunities at several established clinics in The Bahamas. It also has free bedrooms for patients of these clinics to stay in who cannot afford hotel rooms.



Those interested in medical treatments available in other countries should log on to: www.age-reversal. net and provide contact information to stay informed.

Lives Lost because of Over Regulation

The most tragic barrier delaying lifesaving progress is excess regulation of clinical (human) research.

On top of the next page is a slide that chronicles the multi-decade delay in recognizing the benefits of one drug (metformin):



I created an online document to petition the **FDA** to remove bureaucratic roadblocks that are delaying regenerative medicine **clinical trials**. In many cases, the red tape is keeping promising human studies from even launching.

I ask readers to log on to: www.age-reversal.net/ FDA to sign on to this petition that will be used to amend clinical trial requirements so that rapid-fire human studies can launch.



Log on to: **www.age-reversal.net/FDA** to sign on to a petition to help amend clinical trial requirements.

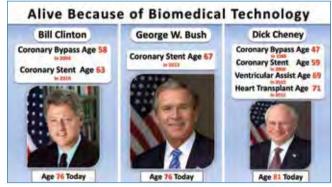
Lethal Impact of Delayed Biomedical Technology

The slides on this page show the premature death of **Lyndon Johnson** (at age 64) and how similarly situated leaders of this country with **coronary artery disease** are living to age 76 and beyond because of advances in **biomedical technology**.

I then postulated that elderly people today are in the same predicament, i.e., we are **aging** to death when potential cures for biological aging may be less than a decade away.

My emphasis is the need to accelerate **rejuvenation research** with <u>more</u> **funding** and <u>less</u> governmental **regulation** over clinical trials.



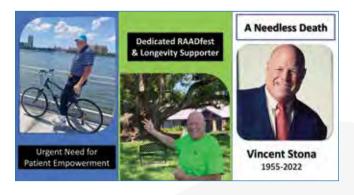




Triumphs and Tragedies

The period from October 2021 to October 2022 was a year of scientific triumphs and needless tragedy.

We lost a dedicated long-term supporter to **type II diabetic** complications and I am determined to STOP these kinds of preventable tragedies.

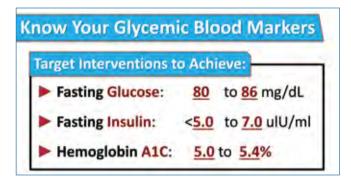


I emphasized during my talk that those with health problems who ignore my dietary and medication suggestions may fail to achieve their super-longevity objectives.

As much as I despise most elements of **Big Pharma**, every once in a while they develop a medication whose benefits outweigh side effect risks.

One of these is a drug class to reduce type II diabetic complications called **SGLT2** inhibitors. I presented many slides on this class of drug that you can view at www.AgeReversal.net

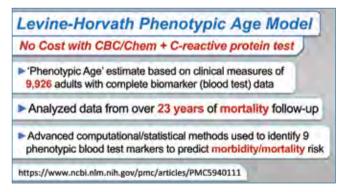
If you have <u>less</u> than optimal **glycemic control**, I urge you to consider a **SGLT2 inhibitor** drug like **Jardiance**® in addition to **metformin**.



A Biological Age Estimate using Low Cost Blood Tests

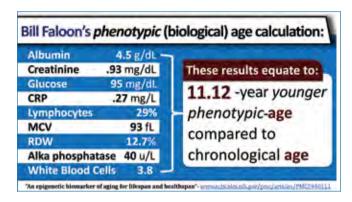
A university research team has developed an algorithm to estimate one's **biological age** with results available from a **CBC/Chem** + **C-reactive protein** blood test.

Known as the **Levine-Horvath Phenotypic Age Model**, it was developed using blood test data to estimate future morbidity and mortality in nearly 10,000 people over a 23-year period.



This **Phenotypic Age Model** is not fully validated to predict biological aging at an individual level. Results from **comprehensive** blood test panels provide more reliable data in our opinion about one's future morbidity/mortality risks.

The slide below shows my score using calculations from the **Levine-Horvath Phenotypic Age Model**. It indicates my **biological age** to be about **11 years** *younger* than my chronologic age.

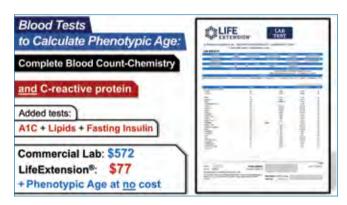


This calculation is available at <u>no</u> extra cost for those who order a blood test panel that provides everything needed for the **Levine-Horvath** age model + fasting insulin, A1C, lipids, and other health measures.

Commercial labs charge over \$500 for these tests, but readers of **Life Extension Magazine®** can obtain this test panel for only \$77.

Once you order this test, you are immediately sent a requisition and list of local blood draw centers throughout the U.S. Results come back quickly and will include the **Levine-Horvath** calculation of your **biological age**.

To order, call 1-800-208-3444 (24 hours) or log on to: www.LifeExtension.com/blood



Note this surrogate measure of one's **biological age** is not the same as the **GrimAge** test described earlier in this article.

I continue to discuss the validity of the **Levine-Horvath Phenotypic Age Model** with experts in the field. What's nice about the Phenotypic Age Model is that its calculations are based on results from blood tests readers of this magazine already utilize on a regular basis.

Additional Topics in My Keynote Presentation

So far, I've presented less than <u>half</u> of the many areas of longevity research and practical applications that occurred since RAADfest 2021.

You can view my RAADfest presentation at: www.age-reversal.net (in video or PowerPoint format) that will cover:

- Massive weight loss with GLP-1 prescription drugs
- What is an Optimal diet? (Live 3 to 13 years longer)
- What's Behind Surging Deaths from Heart disease?
- Impossible become possible...
 Million Times Faster Computation
- Brain Implant Operates Digital Devices (Mind/Cloud interface)
- Elon Musk Predicts Humans can Live Forever
- Record numbers of Famous Dead Billionaires
- Lethal Impact of Elevated Glucose
- SGLT2 Inhibitor drugs protect kidneys, heart, and brain while lowering glucose and A1C.

Annual RAADfest Conference

RAADfest is a **nonprofit** conference whose purpose is to enable aging people to live in good health far *longer* than most anyone can imagine today.

This annual event enables people to stay informed and connect with many of the best doctors, scientists and thought leaders in the field.

RAADfest 2023 will be held in **Los Angeles**, California September 7-9, 2023.

RAADfest 2023 will begin Friday evening and continue all day Saturday with formal presentations going until 3 pm on Sunday. Informal gatherings will occur throughout the Friday-Sunday period.

The registration fee that includes two organic meals and cancelation insurance is **\$647** for LifeExtension readers. (Use code "LEF" to obtain this discounted registration price.)

To learn more or reserve your place at **RAADfest 2023**, log on to: www.Raadfest.com

In Summary...

It is a **privilege** and downright fun to interact with scientists on the front lines of regenerative medicine research.

Our mutual objective is to save **human** lives including our own.

Those interested in receiving email updates about research projects can register at no cost at: www.age-reversal.net

I conclude by asking those who are able to make charitable donations to the **Human Age Reversal Project.**

All donations will only be used to fund actual study costs and not salaries or overhead expenses.

Over **\$1 million** has been raised and nothing will be spent until multi-intervention age-reversal projects commence. (See the slide below.)

Welcome to our fantastic voyage!

For longer life,

William Faloon, Volunteer Age Reversal Network*

WMm

*The Age Reversal Network is a public benefit group that consists of physicians, scientists, activists, and participants in regenerative medicine research. These individuals share a common desire to rejuvenate aged people. To receive free updates that are sent out every 3-4 weeks, log on to: www.age-reversal.net/join

Donate to Human Age Reversal Project





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

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

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3 mg • Net Wt. 2 fl. oz (59 ml)

For occasional sleeplessness.

This product is available at fine health food stores everywhere.





Our Most Complete Omega-3 FISH OIL FORMULA





- Protecting against mitochondrial DNA damage¹
- Delaying **telomere** shortening²
- Supporting DNA function in cells subjected to UV exposure³

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

This **5 mg** potency exceeds the *L-ergothioneine* contained in 2 cups of white button mushrooms, depending on growing conditions.^{4,5}

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 Food Chem. 2017 Oct 15;233:429-33.

Item #02431

30 vegetarian capsules





This product is available at fine health food stores everywhere.

ErgoActive® is a registered mark of Blue California.

RESVERATROL ELITE

UP TO 10 TIMES GREATER BIOAVAILABILITY

Hundreds of published studies describe **resveratrol's** potential **health** and **longevity** effects.

The challenge has been achieving significant sustained **blood levels** of **resveratrol**.

A <u>new</u> **resveratrol** solves this with a special *plant-based* **hydrogel** coating.

In a recent **human** trial*, this technology <u>increased</u> **bioavailability** by up to **10 times**.

This patented process **maximizes** resveratrol availability to your cells.



Resveratrol Elite™

Highly bioavailable fenugreek **hydrogel resveratrol** formula in <u>one</u> daily capsule.

Item #02210

30 vegetarian capsules

This product is available at fine health food stores everywhere.

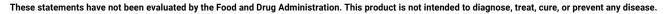


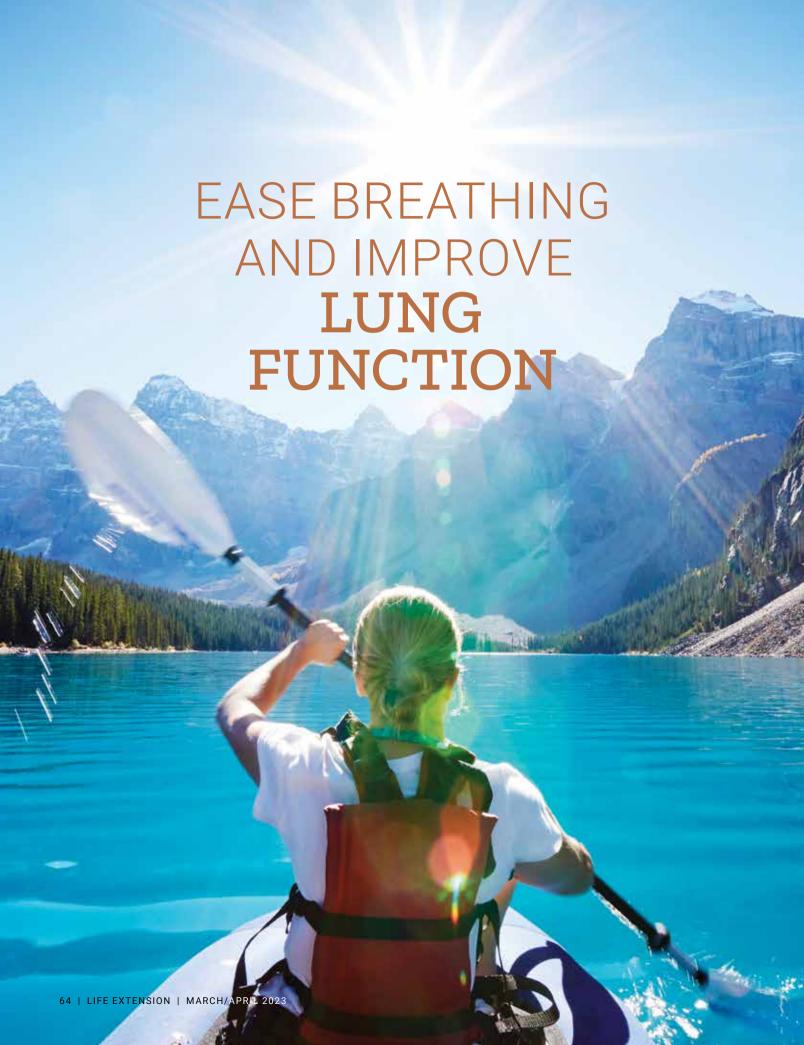


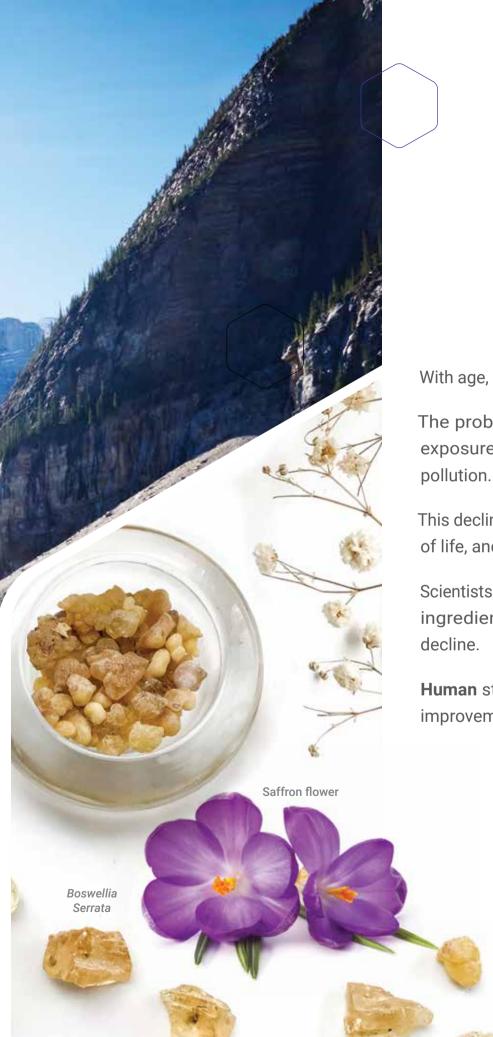
Resveratrol

30 VEGETARIAN SIETARY SUPPLEMENT

[†]Than unformulated resveratrol. *ACS Omega. 2022 Apr 19;7(15):12835-45.







BY MICHAEL DOWNEY

With age, lung function begins to decline.1-3

The problem is further exacerbated by exposure to secondhand smoke and air pollution.

This decline threatens overall health, quality of life, and **lifespan**.²

Scientists have identified <u>four</u> **plant-derived** ingredients that can help counter this decline.

Human studies have validated significant improvements in **lung function**.

Over **40%** of Americans live in areas with poor air quality. Pollution levels correlate with increased rates of **lung disease**.⁴⁻⁶

For example:4

- Ohio has the country's worst air quality and a lung disease prevalence of 15.5%.
- Hawaii has the country's best air quality and a lung disease prevalence of just 3.5%.
- Lung symptoms of air pollution exposure can include coughing, breathing difficulties, congestion and worse.
- Excessive air pollution can result in development of respiratory conditions, including asthma and chronic obstructive pulmonary disease (COPD).

Key Nutrients Can Help

Scientists have identified **four** plant-derived compounds that improve lung health as follows:⁷⁻¹⁶

- Boswellia serrata and Aegle marmelos <u>improved</u> breathing and lung function in healthy adults sensitive to pollution,⁸
- Boswellia serrata, Aegle marmelos, and saffron were shown to improve breathing ability in asthmatics, 7,9,10 and
- In preclinical studies, andrographolide has been shown to reduce smoke-induced lung damage.¹⁴⁻¹⁶

BOSWELLIA-BAEL FRUIT BLEND

Boswellia serrata is a plant found in Arabia and India. It has shown benefits for several conditions, including **asthma**.¹⁷

Bael fruit is a shrub native to the Indian subcontinent and southeast Asia. Its fruit and seeds are used in traditional medicine for various disorders.¹⁸

An equal **blend** of extracts of these plants was shown, in a clinical trial, to *alleviate* asthma symptoms and to provide a clinically meaningful improvement in **lung health** parameters.⁷

In one study, scientists enlisted healthy adults with self-described **sensitivity to air pollution**.⁸

This trial included a group that took a **placebo**, while another group took **200 mg** daily of the **Boswellia-Bael** blend. After just three weeks, the group that received the **Boswellia-Bael** combination had some improved lung function. After **six weeks**, they had a:⁸

- 30.2% improvement in total air exhaled during a spirometry test (which measures lung capacity, or how much air you can breathe into or out of your lungs),
- 16.4% improvement in air forced out in the first second, a measure of air movement through larger airways, and
- 7.4% improvement in aerobic exercise capacity, measured by average speed walked during a six-minute period (from 3.36 mph to 3.5 mph).

COPD and asthma can require use of inhalers for coughing, wheezing, or troubled breathing during a flare-up. For this reason, they are also called rescue drugs or rescue inhalers.

A second study investigated the effect of the same blend in subjects who suffered from mild to moderate **bronchial asthma**. One group took a placebo, while the other took **100 mg** of the **Boswellia-Bael** blend **twice** daily.⁷



The treatment group experienced improved breathing and reduced use of inhalers, including a:⁷

- 50.17% improvement in peak expiratory flow rate, a measure of the maximum amount of air a person can push out of their lungs when exhaling forcefully, after eight weeks, and
- 44% decrease in the use of a "rescue" asthma inhaler after four weeks.

The improvements were attributed to the extracts' anti-inflammatory activity.⁷

SAFFRON

The spice **saffron** has long been used in traditional medicine for respiratory ailments and to counter inflammation, among other purposes.¹⁰

Eighty adults with mild to moderate **asthma** were enrolled in a placebo-controlled trial. After taking **50 mg** of **saffron** twice daily for **eight weeks**, the treatment group had:^{9,10}

- 50% less waking at night due to asthma symptoms,
- 40% less "rescue" inhaler use.
- 36.8% less activity limitation, and
- 33.8% less shortness of breath during the night.

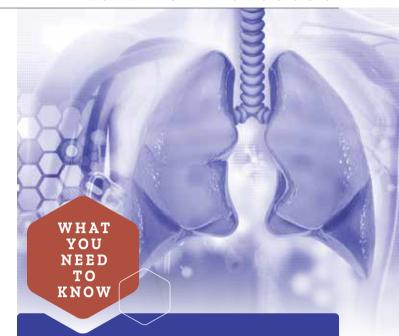
Saffron also reduced biomarkers of **inflammation** (such as C-reactive protein). 10,19-21 Animal data show that saffron has relaxing effects on the smooth muscle of the **trachea** (windpipe) as an additional mechanism of supporting breathing/lung function. 19-25

ANDROGRAPHOLIDE

The compound **andrographolide** is extracted from the stem and leaves of *Andrographis paniculata*. It has been used in traditional Indian medicine and is best known for supporting **immunity**.²⁶

Cell and animal models of smoke- or pollution-induced lung toxicity suggest that andrographolide may protect against **lung damage**. It appears to do so by:^{11,13-16}

- Inhibiting DNA damage,
- Protecting against oxidative stress, and
- Reducing inflammation.



Breathe Easy as You Age

- Beginning around age 25-35, lung function begins to decline with each passing year. Respiratory health is further damaged by air pollution.
- Scientists identified four plant-derived ingredients that enhance lung health: Boswellia serrata, Bael fruit, saffron, and andrographolide.
- Human studies show that a blend of **Boswellia** and **Bael fruit extracts** improved breathing and boosted lung function in healthy individuals, as well as people with sensitivity to air pollution or those with asthma.
- A clinical study shows that saffron extract increased breathing capacity and reduced symptoms in those suffering from asthma.
- Preclinical data suggest that **andrographolide** could protect lungs against pollution and smoke.

A combination of **Boswellia-Bael blend, saffron,** and **andrographolide** may help protect lung function and promote better breathing well into older age.

Summary

Aging, declining lung function, and air pollution can damage **lungs** and cause breathing difficulties. Researchers have identified **four** plant-based ingredients that protect healthy lung function.

A blend of **Boswellia** and **Bael fruit** extracts was clinically shown to improve breathing and relieve asthma symptoms.

Saffron extract was clinically demonstrated to improve asthma.

Andrographolide was found in preclinical research to protect against lung damage from pollutants and smoke.

Together, these ingredients may help preserve vital lung function and breathing capacity. •

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How Breathing Problems Develop

Proper **lung function** is essential to overall health.² But starting around age **35**, lung function declines at a rate of **1%-2%** yearly.¹

That's because **aging** causes changes that can decrease lung capacity:³

- · Diaphragm muscles weaken,
- The tissue that keeps airways open loses elasticity, making airways smaller, and
- Rib cage bones decrease in size, leaving less room for lungs to expand.

Deterioration of breathing capacity affects every cell in the body. This age-related decline may be accelerated by other factors, including inflammation and air pollution.

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What is Metabolic Syndrome?

Metabolic syndrome is a cluster of conditions that includes any three of the following: ⁶

- Elevated blood pressure
- High blood sugar
- Large waist circumference
- Low HDL cholesterol
- High triglycerides

Individuals with **metabolic syndrome** are at increased risk of diabetes and its complications, cardiovascular disease, age-related disorders, and death.^{6,7}

Ouercetin to the Rescue

Scientists have long been intrigued about why unprocessed, plant-based diets are protective against metabolic disease.

One nutrient, the flavonoid **quercetin**, is particularly prevalent in a wide range of fruits, vegetables, and medicinal plants. Hundreds of studies—in cell culture, animals, and humans—have documented the multiple properties of this nutrient.

Many of its effects in the body apply directly to metabolic health, reversing many of the changes present when metabolic health is not ideal.⁴

In a controlled clinical trial in older adults with **metabolic syndrome**, quercetin was shown to improve metabolic health, reduce cardiovascular risk factors, and decrease participants' metabolic age.⁵

Better Blood Glucose Control

Metabolic disease is usually thought to be caused by **insulin resistance** and insufficient blood **glucose control**.

The hormone insulin helps cells to take up and process nutrients from the diet, including sugars. In most metabolic diseases, cells fail to respond to insulin appropriately; this is called **insulin resistance**.^{8,9}

The result of **insulin resistance** is high **blood levels** of **glucose** that contribute to chronic degenerative diseases that accompany aging. That is why individuals with diabetes or the metabolic syndrome have *higher* rates of most chronic diseases.²

After-meal glucose spikes are damaging for all individuals, and likely more so for diabetics. These blood sugar surges are contributors to cellular and vascular damage and raise the risk of cardiovascular disease and premature death.

Quercetin has been shown to *improve* **glucose control** as shown on the following page:



 Preclinical studies show quercetin helps activate cellular pathways—such as AMPK that improve metabolism and reverse insulin resistance.^{4,10,11}

- A meta-analysis of randomized controlled trials revealed that quercetin supplementation for eight weeks or more, at a dosage of 500 mg or higher, reduced fasting blood glucose.
 That same dose also reduced excess insulin concentrations.¹²
- Remarkably, even one single dose of quercetin has been demonstrated to exert a beneficial clinical effect in a study in type II diabetics. In a randomized, placebo-controlled trial, 24 diabetics already being treated with medication were given 400 mg of quercetin before receiving a simple sugar. After the sugar dose, blood glucose was suppressed in those who received quercetin, compared to the placebo arm.¹³
- Another clinical trial found that long-term quercetin supplementation resulted in a significantly improved response (lower blood sugar spike) to an oral glucose tolerance test.⁵

Quercetin supplementation clearly resulted in improved glucose control and a healthier carbohydrate metabolism.

Improved Lipid Levels

Another prominent feature of metabolic disease is elevated levels of LDL cholesterol and triglycerides and reduced HDL cholesterol (the "good cholesterol").² Like elevated blood glucose, these changes are contributors to cardiovascular disease.^{1,2}

Multiple human studies have shown the benefits of quercetin for lipid abnormalities.

In overweight and obese adults with early metabolic syndrome, **150 mg** of quercetin daily reduced **blood pressure** and oxidized **LDL cholesterol**. 14

In healthy men, **150 mg** of quercetin daily for eight weeks decreased **waist circumference**, after-meal **systolic blood pressure** (top number), and after-meal **triglyceride** levels.¹⁵



Improve Metabolism with Quercetin

- Metabolic disorders are increasingly common, and scientists warn of a growing epidemic.
- Metabolic abnormalities include obesity, diabetes, the metabolic syndrome, abnormal blood lipid levels, and non-alcoholic fatty liver disease.
- All these related disorders dramatically increase the risk for age-related chronic diseases, from cancer to dementia.
- Scientists have found that quercetin a flavonoid found in many plants—is protective of metabolic health.
- Clinical and preclinical studies show that supplementation with quercetin can benefit many aspects of metabolic disease, improving blood glucose control and lipid levels while protecting the liver and reducing inflammation and oxidative stress.

In a placebo-controlled trial in 110 patients with metabolic syndrome, aged 60-74, **240 mg** of quercetin daily for three months lowered **total** and **LDL cholesterol**.⁵

A randomized controlled trial found that daily supplementation with quercetin lowered total cholesterol, LDL cholesterol, and triglycerides, and raised HDL cholesterol. ¹⁶

Protection of the Gut and Liver

Animal research has shown that quercetin can protect the liver from abnormal accumulations of fats and can improve lipid metabolism.¹⁷⁻²¹

Even in patients being treated for **non-alcoholic fatty liver** disease, quercetin supplementation has been found to improve liver health, reducing signs of liver damage and inflammation while improving lipid levels.²²

It may also improve the gut microbiome, the mix of bacteria that reside in the intestines. Quercetin may help shift the mix of these microorganisms into a healthier form. Such changes would be expected to reduce inflammation and "leaky gut" and to have the potential of improving the health of other organs as well, body wide.²³

Obesity and Metabolic Syndrome

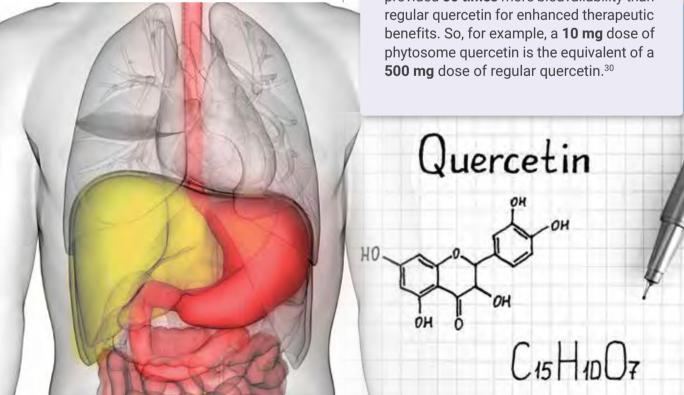
Obesity adds to risks of metabolic disturbances. A prospective study assessing the mortality status of 6,678 healthy middle-aged men concluded that **metabolic syndrome** increased the risk of sudden death from **heart attack** by **68%**.⁷

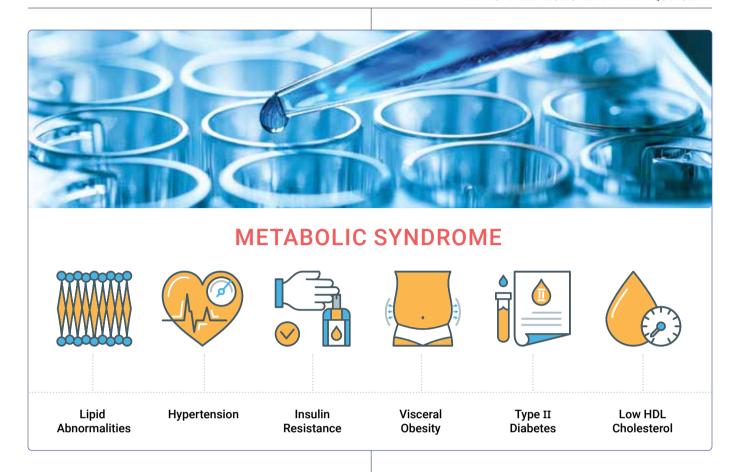
A trial of overweight and obese adults with early metabolic syndrome tendencies tested **150 mg** of quercetin daily. This modest dose reduced blood pressure and lowered levels of oxidized LDL cholesterol.²⁴

Not All Quercetin is the Same

Despite its wide-ranging benefits, quercetin is generally difficult for the body to fully absorb.

Looking to solve this problem, researchers discovered that when quercetin was surrounded by a plant-based **phytosome**, it became much more absorbable. In a clinical study, a **phytosome quercetin** provided **50 times** more bioavailability than regular quercetin for enhanced therapeutic benefits. So, for example, a **10 mg** dose of phytosome quercetin is the equivalent of a **500 mg** dose of regular quercetin.³⁰





Another clinical study found that the same dose of quercetin (150 mg/day) for eight weeks decreased waist circumference and after-meal systolic blood pressure, while also lowering after-meal triglyceride levels in a group of otherwise healthy men.¹⁵

Reduction in Inflammation & Oxidative Stress

Chronic inflammation and oxidative stress due to free radicals are major contributors to all chronic diseases, especially metabolic disease.

Quercetin provides potent activity against both issues. It reduces oxidative stress and promotes the expression of antioxidant enzymes so that the body can better protect itself.

At the same time, quercetin powerfully controls inflammation by modulating cell signaling pathways. Clinical and non-clinical studies have demonstrated that it decreases production of pro-inflammatory compounds and helps prevent chronic inflammation.²⁵⁻²⁸

Increased dietary intake of flavonoids such as quercetin may reduce the risk of chronic illnesses.29

Summary

Metabolic disease is increasingly common. Abnormalities of metabolism manifest in several different conditions including diabetes, obesity, lipid abnormalities, and non-alcoholic fatty liver disease.

The epidemic of these disorders is expected to increase and will contribute to rapid aging and most chronic diseases.

Quercetin, a flavonoid found in several different fruits and vegetables, has a profound effect on metabolic health.

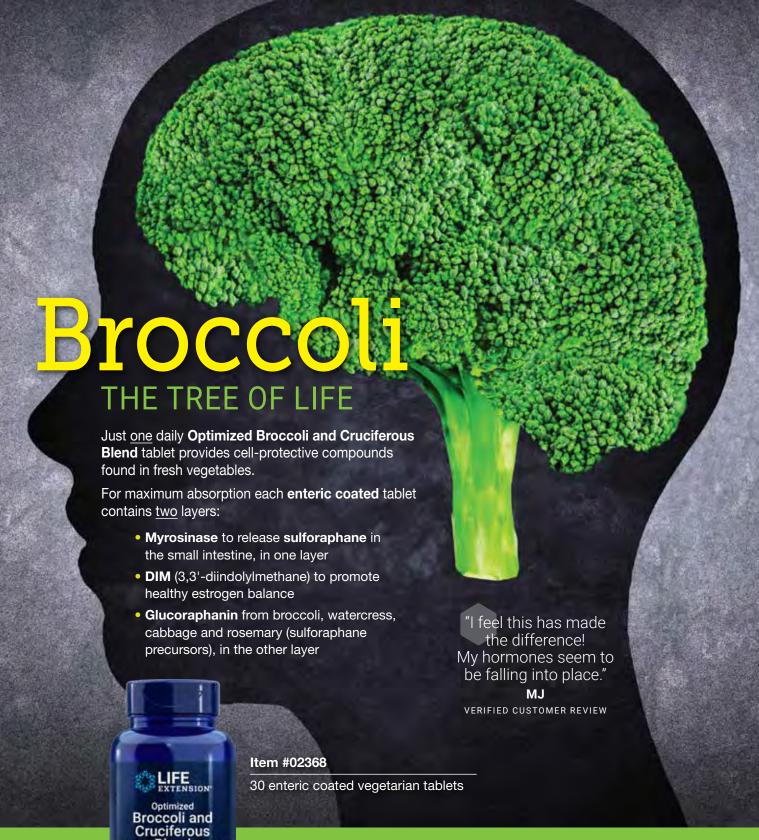
Studies show that supplementation with quercetin has positive effects on many aspects of metabolism, including improved blood glucose control, trimmer physique, improved blood lipid levels and gut health, and protection of the liver.

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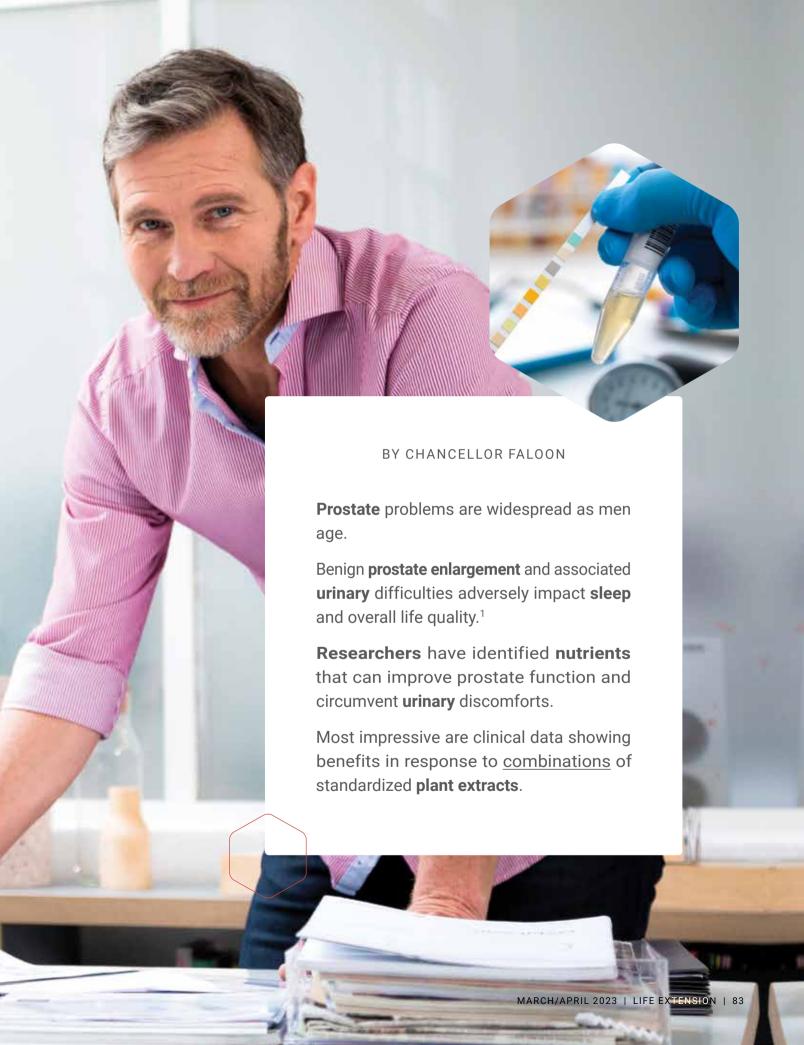






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Consequences of an Aging Prostate

The prostate is a walnut-size gland located just below the bladder in men.1

Prostate cancer is prevalent in aging males² but non-malignant prostate disorders are more widespread.1

Benign prostate hyperplasia (BPH) affects about 8% of men in their 40s and gradually worsens to more than 80% as men age past 79 years.3

Those afflicted with BPH may experience lower urinary tract symptoms, including the sudden need to urinate, frequent urination, waking often during the night to urinate, difficulty urinating, and similar symptoms.4

Medications are available to alleviate BPH, but many men do not tolerate their side effects.

Several nutrients have been shown to reduce urinary symptoms without side effects.

SAW PALMETTO AND BETA-SITOSTEROL

Saw palmetto is a plant native to Florida and has long been used as a drug in Europe to alleviate urinary symptoms associated with BPH.5

A systematic review published in 2020 compared saw palmetto extract with the drug tamsulosin in over 1,000 men with BPH.6

After at least six months of treatment, saw palmetto showed comparable benefits to tamsulosin (with the exception of prostate volume), but without the common side effects of tamsulosin, like ejaculation disorders and decreased libido.

Saw palmetto's effects may be enhanced when its active component, beta-sitosterol, is extracted and taken with it. Beta-sitosterol is a compound that is believed to reduce levels of the hormone dihydrotestosterone (DHT),7 which at high levels is linked to an enlarged prostate.8

In a randomized, controlled trial, men with BPH who took 500 mg of beta-sitosterol-enriched saw palmetto oil daily for 12 weeks had significantly improved symptoms and reduced PSA (prostate specific antigen) levels.9 High PSA levels can indicate an enlarged prostate or possible prostate cancer.10

In another trial, patients with chronic prostatitis who took saw palmetto daily for 12 weeks had significantly improved urinary health scores, including reduced pelvic pain and discomfort.11

Prostatitis, or inflammation of the prostate is frequently caused by bacterial infections. It may cause similar urinary symptoms, along with fever, sexual dysfunction, and pelvic pain.^{1,12}

NETTLE EXTRACTS

Extracts of the dwarf and stinging **nettle plants** can provide a range of prostate benefits.13

Nettle extracts exert anti-microbial effects to reduce prostatitis risk.14 They also enable some reduction in prostate size, improvement in urinary flow, and reduced residual urine in the bladder. 15,16

In a clinical trial, 60 men with benign prostate hyperplasia took either stinging nettle root extract



or a placebo daily for 12 weeks. Those taking the nettle extract had reduced inflammation and improved urinary health scores.17

An evaluation was done of four randomized controlled studies of 922 patients with moderate-tosevere prostate symptoms. Findings from this analysis showed significantly more men responded positively to the combination of saw palmetto and nettle extracts, compared to **placebo**. The majority of those who responded experienced a reduction of one urination episode per night.18

A combination of saw palmetto and nettle extracts is popular in European medicine to improve urinary symptoms in aging men.19

PUMPKIN SEED

Pumpkin seeds have been used to promote urinary health around the world for centuries.20

In one controlled clinical trial, the combination of pumpkin seed and saw palmetto oils resulted in an over 40% reduction in PSA levels, compared to baseline. The improvement was evident after three months and continued throughout the one-year trial.

In this trial, supplementation with either pumpkin seed or saw palmetto oils or both, resulted in improvement in quality-of-life scores.²¹

PYGEUM AFRICANUM

The bark of Pygeum africanum, the African prune tree, contains compounds that support prostate and bladder health.

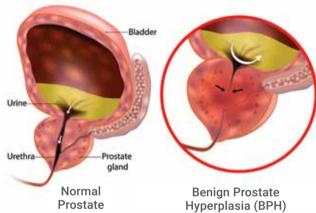
In a rigorous meta-analysis of 18 controlled trials, men taking Pygeum were more than twice as likely as placebo users to report an improvement in BPH symptoms.²²

In a clinical trial of men with BPH, taking Pygeum extract twice daily for two months, compared to baseline, resulted in a:

- 40% improvement in prostate symptoms score,
- 31% improvement in quality of life, and
- 32% reduction in nocturnal urinary frequency.²³

Pygeum has been used in Europe for decades as a medication to improve urinary symptoms in men with BPH.22





Relief for Prostate Problems

- Benign prostate hyperplasia and prostatitis are common diseases of the prostate gland that are frequent causes of urinary problems in men.
- Multiple plant extracts and compounds have been shown to prevent and relieve symptoms of these diseases, without side effects that may come with medications, and may even reduce risk of prostate cancer.

BOSWELLIA

Boswellia serrata, also known as Indian frankincense, has been used for centuries in traditional Indian medicine to treat inflammatory conditions.

Preclinical research has shown that it can:

- Induce death in prostate cancer cells,^{24,25}
- Decrease formation of androgen receptors that many prostate cancers require to survive, and²⁶
- Inhibit the growth of blood vessels that tumors need to metastasize.²⁷

Clinical studies are needed to evaluate how these beneficial functional effects may impact prostate cancer risk and outcomes in aging men.

FLOWER POLLEN

Research suggests that **flower pollen** benefits the prostate by relaxing smooth muscle tissue in the urinary tract and potentially alleviating **lower urinary tract symptoms**.^{28,29}

One study found that a **ryegrass pollen extract** worked as well as six different drugs commonly used for **benign prostate hyperplasia**.³⁰

In a preclinical study, **flower pollen extract** reduced harmful activity of altered prostate cells, which suggested it could benefit **prostatitis** and have a possible **prostate cancer** preventative effect.³¹

NORWAY SPRUCE

Research has shown that *increased* dietary intake of **lignans**, polyphenols found in many plants, correlates with *reduced* **prostate cancer** risk.³²⁻³⁴

The **Norway spruce** contains particularly high amounts of lignans.

In preclinical studies, Norway spruce lignans reduced **prostate tumor** volume and increased the death of cancer cells. Other Norway spruce extracts reduced **lower urinary tract symptoms** in a model of chronic **prostatitis**. 35,36

In the body, lignans convert into a compound called **enterolactone**,³⁷ which may promote hormonal changes associated with lower prostate cancer risk.^{38,39}

An epidemiological study found that those with the *highest* **enterolactone** levels were **60%** less likely to have **prostate cancer** than those with low levels.³³

BORON

Boron is a mineral with benefits throughout the body. 40

Preclinical research in mice found that boron can decrease the size of existing **prostate tumors**.

In addition, a large survey showed that the risk of prostate cancer was 52% <u>lower</u> in those whose daily boron intake averaged 1.8 mg compared to those who consumed 0.9 mg or less.⁴⁰





LYCOPENE

Lycopene is a carotenoid found in many plants, including tomatoes.⁴¹ One meta-analysis found that *higher* lycopene intake was associated with reduced risk of prostate cancer.⁴²

Other research has found that increased **lycopene** intake is associated with decreased prostate size, 41,43 and reduced risk for prostate cancer development *and* progression. 43,44

Summary

Many men over **age 40** deal with persistent **urinary** discomforts mostly caused by **benign prostate hyper- plasia** and sometimes **prostatitis**.

A large volume of published scientific data demonstrates benefits in response to certain nutrients individually.

Even more impressive is evidence showing significant results when these **plant extracts** are taken in combination.

Some of these nutrients possess mechanisms that may help protect against prostate cancer development. •

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William Shatner Stem Cells and other Methods to Fight Aging



William Shatner rose to fame in his role as Captain James T. Kirk on the TV series *Star Trek* in the 1960s.

Now, more than half a century later, the **91-year-old** actor has become the embodiment of the legendary phrase, "live long and prosper."

His career as an actor, director, singer, and author spans seven decades, and includes a Golden Globe and two Emmy Awards.

He has written **30** books, recorded 8 albums, performed on Broadway, and has participated in more than 250 television shows, movies, and plays.

In recent years, his personal life has taken center stage.

Shatner is a well-respected breeder of world champion horses, and at age **89**, he rode one of his horses to an amateur World Champion title.

At **90**, Shatner became the oldest person ever to fly into space, traveling as a passenger on **Jeff Bezos'** spaceship, Blue Origin.

Now, at **91** years old, he maintains a zest for life and sharp wit that has left many people asking, what's his secret?

Shatner's Longevity Secrets

William Shatner has a signature sense of humor that has become as synonymous with his name as Captain Kirk.

So, when asked his secret to a good, long life, it's hardly surprising that Shatner offered these words of wisdom:

"Don't die. That it; that's the secret," he said in his book, *Live Long And*.... "Simply keep living and try not to slow down."

But a closer look at his life reveals that Shatner implements many key life-extending practices shared by the world's longest-living "Blue Zone" communities. This includes lifestyle habits like living with purpose, getting lots of natural movement, eating a more plant-based diet, and prioritizing family.

Most recently, he received a stem **cell** treatment designed to systemically deliver restorative factors throughout his body.

Shatner's therapy involved intravenous infusion of stem cells manufactured in Southern California.

Stem cell treatment has not been approved by the FDA for the treatment of any specific disease. Ongoing research has focused on treating immune disorders, metabolic diseases, neurological impairments, aging, and more.

When **Shatner** announced his **stem cell treatment** on the popular social media platform, Twitter, he said, "Is it possible to turn back the clock? I will let you know."

On November 21, 2022, an announcement was made by the California Institute of Regenerative Medicine that \$8 million additional dollars were allocated to conduct more human stem cell research initiatives.

Living Your Passion

Not long after receiving the stem cell therapy, Shatner became the oldest person to travel into space. This 10-minute, 17-second journey changed his perspective on life.

"I was so thoroughly unprepared for this experience. It was among the strongest feelings of grief I have ever encountered," said Shatner in his new book *Boldly Go*.

"Going into space made me so aware of how fragile our lives are here on Earth, how we need each other, and need to continue to strengthen bonds that connect us to each other. Because out there, there is no life. There is no us."

The journey was also physically demanding.

Traveling at more than 2,000 MPH, passengers experience 5.5 Gs of force—which feels like five times their body weight pressing on their chests, making it difficult to breathe or move.

Passengers must also be able to pass a fitness test prior to the flight, which consists of climbing seven flights of stairs in a minute and a half.

How has Shatner remained robust enough to endure such intense physical strain? He would likely say it's by riding his beloved horses.

November 21, 2022

UC San Diego Awarded \$8 million To Expand Stem Cell <u>Human</u> Trials

Alpha Stem Cell Clinic at UC San Diego is a network of **stem cell clinics** in California.

California Institute of Regenerative Medicine awarded Alpha **\$8 million** in <u>additional</u> funding to conduct **human** stem cell research.

This comes to \$72 million in recent funding from the California Institute of Regenerative Medicine.

Alpha Stem Cell Clinics:

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CIRM Alpha Clinics
UC Davis Health
UCLA UCI
UC San Diego Health
UCSF Alpha Stem Cell Clinic

health.ucsd.edu/news/releases/Pages/2022-11-21-uc-san-diego-awarded-8m-to-expand-stem-cell-therapy-clinical-trials.aspx



Staying Active

"I ride two to three hours every morning that I'm not working—two to three days a week," Shatner said in an interview with the *LA Times*. "Riding is a stretching and strengthening exercise. It requires balance, expertise, finesse, and strength."

Horseback riding also gives him the *motivation* to keep himself fit.

"I wake up every morning thinking, I've got to keep myself in shape to ride horses," Shatner said. "If I am not sitting on a horse at least once or twice a week, it feels detrimental to my heart."

Riding horses has become one of Shatner's greatest passions—and it all began by accident. While attending a horse auction, he made a gesture that was mistaken for a bid.

Too embarrassed to back out of the purchase, Shatner went home with his first horse. "That happy accident led to a part of my life that has brought me so much joy I can scarcely believe it; it sometimes makes me cry just to think about it," said Shatner. "Today, at **age 91**, I am a **better rider** than I've ever been."

Shatner has ranches in Kentucky and California, where he breeds and shows world-champion Saddlebred and Quarter horses. He regularly competes with these horses in riding and cart-driving competitions.

As recently as **2019**, Shatner won the title of **world champion** in the Amateur Roadster to Bike Championship at the Kentucky State Fair with one of his Saddlebred horses. He has also won reining awards showing his Quarter horses.

His passion for horses and people led him to start the Hollywood Charity Horse Show in 1990, a yearly fundraiser that supports local and national children's and veteran's charities.

According to Shatner, the charity raises \$400,000-\$500,000 per year, and **100%** of the donations goes to the 501c3 charities he has selected.

Family and Fun

In addition to horseback riding, Shatner exercises in the pool for 30 minutes a day, running in place and doing arm and leg exercises.

He also minds what he eats, saying, "I try to adhere to a more plant-based diet these days, with occasional exceptions, and if I am to fish, it must only be for food. Never for sport."

Shatner has a youthful wonder about life that pushes him to constantly try new things.

For example, when he was in his mid-80s, Shatner purchased his first electric bike for himself and his wife, Elizabeth, and they routinely go on 20- to 30-mile excursions.

An e-bike has a motor that assists you when you're pedaling.

"The e-bike got me outside and got me fitter," he told the *LA Times*. "Going up the hills is not a problem. I've got an arthritic back from all the horseback riding, my muscles are tender, yet I go back to my car when the bike ride's over and I feel perfect."

This has not only kept him active but has also provided an activity he can enjoy with his entire family.

Shatner regularly bikes with more than a dozen of his family members over the hills of Santa Barbara. With this new shared hobby, "a family that was always somewhat tight became a hugely cohesive group," explained Shatner to AARP.

Future Plans

For Shatner, remaining active—physically, professionally, and socially—is part of his unofficial longevity program.

"I know that good, healthy aging comes from not being solitary or brooding," he said in an article in *Newsmax*. "Say yes to the opportunities life is offering. Say yes to life, yes to dinner, yes to going out, and yes to something new. Because time is too short to lose one opportunity to sacrifice another."

He also continues to say yes to work.

Since turning 90, Shatner released the book, *Boldly Go*, he recorded a self-titled album called "Bill", was the star guest at the 2022 LA Comic Con, and he's working on a documentary detailing his trip into space.

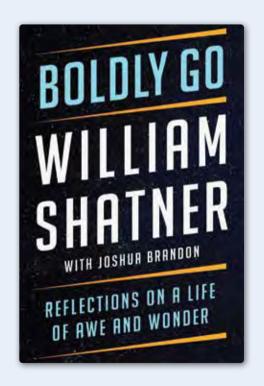
He is also the host and executive producer of a documentary series on **The History Channel** called *UnXplained*, a non-fiction series that explores the mysteries of the world.

Shatner has been through many desperate times in his life—out of work, broke, divorced, living in his car with his dog.

Yet he never stopped pursuing the acting career he believed was his calling, and never took any of his successes for granted.

Perhaps that is why, now that he is in his ninth decade, Shatner has such a zest for life, a thirst for knowledge, and a deep appreciation of the world around him.

"If you allow yourself to be awed by life, to keep drinking in its limitless knowledge, to keep striving for answers, to enjoy the beauty around us at every moment, to never stagnate... well, then you might find yourself living for a very long time, and, ideally, prospering," said Shatner. "Or, in the absence of the longevity and self-defined prosperity you seek, you might well find meaning, or even better, happiness."



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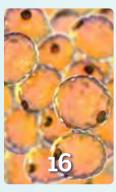




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IN THIS EDITION OF LIFE EXTENSION MAGAZINE®











16 CITRUS EXTRACT REDUCES BELLY FAT

In two human trials, a new citrus extract *decreased* waist circumference up to **2.79 inches**.

24 SOLUTIONS: PROTECT AGAINST DOPAMINE DEFICIT

Inhibiting an *enzyme* called MAO-B boosts brain **dopamine** levels, protecting neuronal structures, and improving mood.

30 FEEL BETTER FASTER

Studies show that **elderberry**, **zinc**, and **vitamin C**, taken in the *early* stages of a cold or flu, can *shorten* their duration.

38 POMEGRANATE AND HEART HEALTH

Pomegranate protects the **heart** and **endothelium**. In a clinical study pomegranate *reduced* **arterial plaque**.

48 AGE-REVERSAL UPDATE

Advances in the sciences of **age-delay** and **age-reversal** were presented at the annual **RAADfest 2022** conference by William Faloon.

92 HOW WILLIAM SHATNER DEFIES AGING

Ultra-healthy at age 91, **William Shatner**, Star Trek's Captain Kirk, engages in a host of personal life-extending practices and attitudes.