Turn “On” Your DNA Repair

Improve Sleep
Via Gene Repair

Probiotics Improve
Immune Health

Relieve Nighttime
Urinary Distress

Novel Method to
Prevent Glaucoma

Age Reversal
Impact of
NAD+

Improve Sleep
Via Gene Repair

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Immune Health

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Normal aging results in marked decline of cellular NAD+. Oral ingestion of nutrients like nicotinamide riboside boosts NAD+ in cells throughout the body.
**NAD+** is a coenzyme found in all living cells. It is essential for energy production and DNA repair.\(^1\-^3\)

In 2014, we introduced a NAD+ precursor called **nicotinamide riboside**.\(^4\) When you take nicotinamide riboside, it converts to NAD+ in your cells, where it facilitates regenerative processes.\(^5\)

The most important NAD+ benefit is promoting rapid DNA repair and fueling beneficial longevity proteins.\(^2\-^3,^6,^7\)

**Resveratrol** favorably enhances the activation of cellular sirtuin proteins.\(^8\) NAD+ is required for our sirtuins to function.\(^7,^9,^10\)

As we age, NAD+ levels plummet, which impedes the ability of resveratrol to deliver its benefits.\(^11\-^14\)

In 2003, we introduced **resveratrol** based on its ability to activate sirtuin longevity factors.\(^15,^16\)

Genetic research we conducted back then indicated that biologically meaningful resveratrol dosing for humans might be as low as \(20\ \text{mg}\) a day.\(^16,^17\) Subsequent studies suggested higher resveratrol intake.\(^18,^19\)

Based on our interpretation of emerging evidence, we have reformulated our premium supplements to provide more NAD+ precursor (nicotinamide riboside) with lower resveratrol.

You’re going to learn about potential age-reversal benefits of boosting cellular NAD+ later this year. This article will provide a summary of what’s been uncovered in recent published studies.
Resveratrol and NAD+

Resveratrol has become a popular dietary supplement because of its ability to activate sirtuin proteins in our cells. When sirtuins are activated, the effect is delayed aging, which has been demonstrated in a wide spectrum of experimental models, including mammals. Sirtuins that are activated by resveratrol require NAD+ as their energy substrate. Loss of NAD+ impedes beneficial sirtuin function.

Younger people have high NAD+ levels that enable them to benefit from the sirtuin-boosting effects of resveratrol. To improve the functionality of sirtuin proteins, it makes sense for maturing individuals to boost their NAD+ levels. The good news is that a precursor to NAD+ can be found in nicotinamide riboside supplements. New dosage recommendations can enable older people to restore cellular NAD+ to more youthful profiles.

NAD+ Benefits More Than Just Sirtuins

The favorable effect of resveratrol in promoting sirtuin activity is well established. For sirtuins to function properly, they must have sufficient NAD+ to fuel their activity.

Protecting against pathological aging, however, requires more than securing sirtuin structure-function. We must also ensure the following two types of DNA damage are repaired:

- **Single-strand** DNA breaks occur often and are usually fixed by nutrients that most of you supplement with today.
- **Double-strand** DNA breaks are more difficult to restore. Left unrepaired, double-strand breaks create cellular havoc that can lead to systemic degeneration.

A critical enzyme that repairs double-strand DNA breaks is PARP1. For the PARP1 enzyme to function it requires lots of NAD+.

NAD+ is required for healthy cellular functions including DNA repair. The amount of damage inflicted to cellular DNA is grossly underestimated. Be it background radiation or normal metabolic processes, our DNA is constantly "broken" and then "repaired" using specialized coenzymes like NAD+.

Failure to repair damaged DNA can result in cell death or transformation into malignant or senescent states.

NAD+ levels markedly decline with age. NAD+ deficit manifests clinically in the form of degenerative disorders of the brain, heart, and other tissues.

In animal studies, regenerative effects have been observed in the brain when NAD+ is restored. Sleep quality deteriorates with normal aging in many people. Restoring youthful NAD+ levels in the brain may support a healthy circadian rhythm.

Loss of NAD+ activity is linked to type II diabetes. In mice, administration of an NAD+ precursor restores insulin sensitivity and protects against the diabetic impact of a high-fat diet.

Damaged DNA.
When it comes to protecting against cancer, a tumor suppressor called p53 protects against runaway cell propagation. NAD+ supports p53 activation to help thwart malignant transformation.51-53

Magnitude of Daily DNA Damage

Few people understand the degree of daily damage inflicted to their cellular DNA.

To put this into perspective, a study analyzed how many double-stranded DNA breaks occur per cell each day. The number turned out to be 10 DNA breaks per cell every day.54

Your cells require NAD+ to facilitate repair of DNA breaks. Sufficient NAD+ is needed for the PARP1 repair enzyme to function.49,50,55

Imagine every dividing cell in your body undergoing ten double-stranded DNA breaks per day and NOT being repaired because your NAD+ is depleted from aging, or from outside abuse such as excess alcohol and toxic food ingestion.

It explains many degenerative pathologies that occur as aging cells lose their NAD+.

Repairing DNA breaks will probably go a long way towards preventing cells from turning malignant. That’s because NAD+ helps maintain activity of cell division regulators like p53.51-53

Restoring Youthful Cell Functionality

As we age, beneficial genes that support cell health “turn off” while detrimental genes overexpress. Nutrients like curcumin help suppress genes that generate system-wide inflammation.56-59

Likewise, omega-3s60-66 and vitamin D67-70 favorably impact hundreds of genes that protect against degenerative illnesses.

To reverse the accumulation of damage inflicted to cellular DNA, we should support the efficient function of PARP1 enzymes.

PARP1 facilitates DNA repair via multiple mechanisms.

Higher NAD+ cell levels enable PARP1 to function properly.49,71,72

Aging creates a chaotic environment in the brain that can make sound sleep difficult.73 As DNA is repaired, we regain youthful cell functionality that can result in improved overall health.

Combining resveratrol with more nicotinamide riboside supports healthy cellular NAD+ levels,73 which are important to support anti-aging enzymes like PARP1 and BubR1.71,74,75

Nutrients That Facilitate DNA Repair

People seeking to extend their lifespans today avoid toxins (such as tobacco smoke and overcooked food) that damage DNA.

Vitamin D has been shown to play an important role in DNA repair, which helps explain why people with higher levels of vitamin D show lower rates of most degenerative diseases.70,76-78

Folic acid also plays a role in maintaining certain DNA repair mechanisms.79-85

Many of the supplements we take daily help facilitate DNA repair. The box below provides a partial listing of these nutrients.

Up until now, no nutrient could accelerate DNA repair to the magnitude needed to induce possible age-reversal benefits.

That may have changed based on data showing remarkable DNA repair occurring when the amount of NAD+ (nicotinamide adenine dinucleotide) is increased in our cells.3,86

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BubR1 is an enzyme that protects against chromosome instability. According to one study, sustained high-level expression of BubR1 “provides a unique opportunity to extend healthy lifespan.”

Some of you may find these new acronyms like PARP1 a bit confusing.

I hope you appreciate (as I do) how rapidly our understanding of aging is expanding, along with accessible ways to reverse many degenerative changes.

Take Control by Boosting Your NAD+

George Church, PhD, is a Harvard professor pioneering CRISPR/Cas9 gene editing technology.110,111

Once perfected, Dr. Church has publicly stated that this will enable aging humans to “edit” their genes in a way that will empower them to regain youth.

We’ve reported on Dr. Church’s research in past issues of Life Extension Magazine®.110,111 This age-reversal gene-editing technology is predicted to be perfected in the next 5-10 years.

In the meantime, we can exert significant control over cellular health factors by taking more nicotinamide riboside. This will boost NAD+ blood levels several fold.5

How our genes are expressed and their stability determines whether we retain healthy vitality or suffer relentless degeneration.

Nutrients like curcumin,112,113 fish oil,60-63 folate,114-116 and vitamin D70,117-119 promote youthful genomic stability.

The box below displays additional benefits one can obtain by boosting cellular NAD+

This can be accomplished by supplementing with 250 mg each day of nicotinamide riboside that converts to NAD+ in your body.

We may recommend higher nicotinamide riboside doses in coming months as scientific data emerges.

For longer life,

William Faloon, Co-Founder Life Extension Foundation Buyers Club

References


(References continued on page 12.)

What is NAD+ Used For?
As We See It

What Should Cancer Patients Being Treated With Chemo or Radiation Therapy Do?

Cancer chemotherapy drugs function via several destructive mechanisms, but the ultimate objective is to inflict massive damage to DNA so that cancer cells are destroyed. Radiation does this by directly breaking DNA strands.

One way cancer cells escape complete eradication after exposure to chemotherapy or radiation is to repair damaged DNA via a wide range of survival mechanisms.

Some studies suggest adding “DNA repair inhibitor” drugs might enable conventional chemo/radiation therapies to kill more cancer cells.

The downside to DNA repair inhibitors is they might increase the toxicity of chemo/radiation therapy to healthy cells and thus create more serious side effects. To cite a conclusion from a published study on this topic:

“With the addition of DNA repair inhibitors, standard chemotherapy could become more effective but also more toxic.”

What the above conclusion alludes to is that adding drugs that impede DNA repair might make chemotherapy more effective, but in the process make the chemotherapy more toxic. A major limiting factor to chemotherapy is toxicity so severe that patients are forced to discontinue therapy even when it is demonstrating efficacy.

For example, one of many toxic side effects of chemotherapy is painful neuropathy. Cancer patients who take steps to boost their NAD+ levels have experienced relief from fatigue. Animals given nicotinamide riboside experienced reductions in chemotherapy-induced neuropathy.

Another side effect of certain chemotherapy drugs and radiation to the chest is heart failure. Nutrients like coenzyme Q10 have been shown to protect against this cardiac damage and improve survival in cancer patients. Conventional oncologists are largely unaware of this clinical research.

As it relates to supplementation with higher-dose nicotinamide riboside, we’ve reviewed numerous published studies and it is not possible to reach a rational consensus as to what actively-treated cancer patients should do as it relates to boosting their cellular NAD+.

Out of an abundance of caution, we suggest cancer patients undergoing chemotherapy or radiation avoid higher-dose NAD+ during therapy and for a reasonable period after.

The conundrum cancer patients have faced for decades are arguments from many oncologists to take no supplements during chemo/radiation therapy. The concern is the nutrients might protect malignant cells from destruction.

Opposing this conventional view are numerous studies demonstrating that nutritional and herbal supplements do not interfere with the effectiveness of chemotherapy or radiation therapy. Furthermore, a myriad of controlled studies show marked survival improvements when cancer patients supplement with nutrients that boost immune function and protect against treatment side effects.

Stated simply, malignant cells can preferentially “hijack” many of the same factors healthy cells require for survival. There is thus a delicate theoretical balance as to what cancer patients should do during conventional treatment. For updated guidance on nutrients, hormones and off-label drugs that actively-treated cancer patients should consider, refer to our updated protocols at:

www.LifeExtension.com/Chemotherapy and
www.LifeExtension.com/Radiation


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Vitamin K1, vitamin K2 (MK-4), and vitamin K2 (MK-7) can also be found in Life Extension® Once-Daily Health Booster. If you take Once-Daily Health Booster, you do not need additional Super K with Advanced K2 formula.

Warning to Coumadin® (warfarin) Drug Users: Patients prescribed vitamin K-antagonist anticoagulant prescription drugs like warfarin should consult their physician before taking vitamin K supplements like Super K and Super Booster. There is evidence, however, that users of drugs like warfarin could benefit from a consistent low dose of supplemental K. Ask your doctor if you can take a low dose (45 mcg a day) of vitamin K2 in the long-acting MK-7 form for the purpose of stabilizing your INR levels and also protecting your body against long-term vitamin K deficit. Do not initiate any form of vitamin K supplementation without full cooperation of your treating doctor, as your doctor may need to increase your dose of warfarin to compensate for your vitamin K supplement. Life Extension® provides several forms of low-dose vitamin K for physician consideration.

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This new formula combines **250 mg** of NAD+ precursor **nicotinamide riboside** with **100 mg** of **trans-resveratrol** and other **plant extracts** in **one** daily capsule.

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Boosting NAD+ Levels Slows Aging

A 2017 review of the literature has found that supplementation with NAD+ precursors nicotinamide riboside or nicotinamide mononucleotide increases lifespan in mice. It also improved their mitochondrial, brain, muscle, and melanocyte stem-cell function.*

In one of the papers discussed, researchers identified a protein that aids in DNA repair in young mice. The research shows NAD+ levels can be boosted through NAD+ precursor supplementation, reducing DNA damage and bringing cellular activity back to youthful levels.

Researchers believe the medical implications for humans indicate that supplementation with nicotinamide riboside at doses of 100-250 mg or more can increase NAD+ levels systemically.

Editor’s Note: The study’s authors note that the exact mechanism of declining NAD+ levels and their basic importance to the aging process are still under investigation.

Meat Carries Mortality Risk for Cancer Survivors

Breast cancer survivors who had a higher intake of meat were found to be at greater risk for dying.*

The study included 1,508 women diagnosed with breast cancer. Interviews conducted during 1996-1997 and five years later obtained information concerning subjects’ consumption of grilled, barbequed, and smoked meat.

There were 597 deaths during a median 17.6 year study period, including 237 deaths associated with breast cancer.

In comparison with an intake below the median, having a higher intake of the meats prior to diagnosis was associated with a 23% greater risk of dying from any cause.

Editor’s Note: For women who continued to consume higher amounts of grilled, barbecued and smoked meat after diagnosis, the risk of all-cause mortality was 31% higher than those whose intake was lower before and after diagnosis.

Attentive Diabetes Management Extends Life

Strict management of type II diabetes can make a significant difference in quality and length of life.*

A 20-year study divided 160 people—all of whom were at risk of type II diabetes—into two groups. One group stayed with their usual treatment, while the other changed to a more multitargeted, aggressive regimen.

Results showed the intensive-treatment group lived, on average, 7.9 years longer than the “normal” treatment group. Also, in the aggressive treatment group, the risk for a number of diseases (including kidney disease, heart disease, and blindness) was reduced.

When the study began, the average subject age was 55, and all were borderline obese.

According to senior study author Dr. Oluf Pedersen, the intensive treatment was aimed at reducing a comprehensive selection of adverse factors such as blood-clot risk, high glucose, high blood pressure, triglycerides and cholesterol. The regimen included behavior modification (exercise, healthy diet, no smoking) and medications when deemed necessary.

Editor’s Note: Dr. Joel Zonszein, director of New York’s Clinical Diabetes Center at Montefiore Medical Center, stated, “These results are impressive, and the message is important. Physicians are not being aggressive enough...If you look at all the factors they (the researchers) treated, about 80% of the U.S. population isn’t treated correctly, according to national surveys.”

Aspirin Fights Cancer

A recent study suggests aspirin could slow the growth of some types of cancer.*

The research was designed to determine how inhibition of platelet activation through the use of aspirin might affect the proliferation of colon and pancreatic cancer cells.

Platelets, when activated, cause blood to clot. They can also promote the growth of cancer cells through releasing growth factors and enhancing the response of oncoproteins, which regulate the development of tumor cells. Aspirin is an anti-platelet drug, and low doses have been known to reduce the risk of some gastrointestinal cancers by mechanisms still under investigation.

Researchers combined platelets with metastatic (cancer that has spread to other parts of the body) colon cancer cells, nonmetastatic (cancer that has not spread) colon cancer cells, and nonmetastatic pancreatic cancer cells. Aspirin was then added to all three groups.

Results showed that a low aspirin dose stopped platelets from prompting growth and replication of nonmetastatic pancreatic and colon cancer cells. The growth of metastatic pancreatic cancer cells could also be stopped with aspirin, but only at doses too large for humans to ingest. Metastatic colon cancer cells were unaffected at any dose.

These data are corroborated by human studies showing lower risk of many cancers in those taking low-dose aspirin daily.

Editor’s Note: The researchers found these results promising. “Our study,” they wrote, “reveals important differences and specificities in the mechanism of action of high- and low-dose aspirin in metastatic and nonmetastatic cancer cells with different tumor origins and suggests that the ability of aspirin to prevent platelet-induced c-MYC (an oncoprotein) expression might be selective for a nonmetastatic phenotype.”

Vitamin D Relieves Back Pain

A trial reported in *Pain Physician* uncovered a significant benefit for supplementing with **vitamin D** among individuals with chronic lower back pain.*

The trial included 68 men and women who had chronic lower back pain for at least three months which did not respond to medication or physical therapy.

Subjects were limited to those whose plasma 25-hydroxyvitamin D levels measured at the beginning of the trial were less than **30 ng/mL**.

Participants received a total of **60,000 IU** of vitamin D3 given orally once per week for eight weeks. Pain and disability were scored at the beginning of the study and at two, three and six months.

Following supplementation, **66%** of the patients attained sufficient levels of plasma 25-hydroxyvitamin D. Pain and disability scores significantly improved at two, three and six months in comparison with scores obtained at the study’s onset.

**Editor’s Note:** Authors Babita Ghai, MD, DNB and colleagues observe that vitamin D exerts anatomic, hormonal, neurologic and immunologic influences on pain expression. “Our findings provide a reasonable explanation and justification for advising dietary supplementation as well as therapeutic medication to achieve normal vitamin D levels in patients with musculoskeletal pain,” they write.

Just-Published Protocols in
Disease Prevention and Treatment

The scientists and writers at Life Extension® continuously update the online Disease Prevention and Treatment protocol chapters based on the latest research. Recent updates are briefly summarized here with complete versions of these chapters and references available online at: http://www.lifeextension.com/Protocols

**EXERCISE ENHANCEMENT** – Physical inactivity is the fourth leading risk factor for premature death worldwide. Many people are unaware that even modest physical activity, such as brisk walks, can improve cardiorespiratory fitness. This protocol summarizes effective strategies for enhancing cardiorespiratory fitness regardless of age.

Research on enhancing the metabolic adaptations triggered by exercise includes carnitine, whey protein, and creatine, as well as DHEA and bioidentical hormone replacement.

**IMMUNE SENESCENCE** – The declining function of the immune system, called immune senescence, is one of the biggest risk factors for many diseases that occur in advancing age.

Caloric restriction, or the Mediterranean-style diet, and effectively managing stress can promote healthy immune system functioning. Emerging techniques to maintain healthy immunity include young stem-cell mobilized plasma, which may stimulate youthful immune activity in older recipients.

Natural interventions including reishi mushroom, cistanche, and Pu-erh tea may help counteract age-related immune decline.

**PNEUMONIA** – Pneumonia risk increases with age as a consequence of immune senescence.

Taking steps to boost immune function is of the utmost importance. Evidence suggests that regular aspirin use and treating pneumonia patients with adjuvant corticosteroids might improve outcomes.

Natural interventions like vitamin D, zinc, reishi mushroom, and probiotic supplements may help bolster immune defenses against pneumonia-causing pathogens. Combining these approaches with the pneumococcal vaccine could be lifesaving.
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Caution: Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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Ben Stiller Wants Men to Test for Prostate Cancer

Actor Ben Stiller was as surprised as anyone when he heard these words: “So yeah, it’s cancer.”

After all, he was only 48 and had no real reason to suspect that he had cancer, especially prostate cancer, which many people think of as an older man’s disease.

“I have no history of prostate cancer in my family and I’m not in the high-risk group,” he wrote in a public posting detailing his experience. “I had no symptoms.”

So how did the star of movies including *There’s Something About Mary*, *Meet the Parents*, and *Zoolander* end up getting diagnosed in the first place? And what does his case have to say about the way we diagnose and treat prostate cancer in the United States?

Stiller’s story began two years before the day in June 2014 when he was diagnosed with prostate cancer. This is when his doctor, a “thoughtful internist”, gave him a simple and inexpensive PSA screening test. This was the first of many PSA tests over the next few years.
A one-time modest elevation of PSA blood levels can be explained by several factors that are often correctable. So the best course of action is to have follow-up PSA tests to monitor what direction the PSA is moving in.

As follow-up PSA tests were performed, Ben Stiller’s doctor noted a gradual rise in Stiller’s PSA over his earlier baseline. These rising levels triggered a referral to a urologist, who did further testing, including a digital rectal exam, an MRI, and finally a biopsy that confirmed the diagnosis.

Three months after his diagnosis, Stiller had undergone treatment—in his case a robotic-assisted laparoscopic radical prostatectomy, or removal of his prostate gland during a minimally invasive surgery—and was cancer free. That could have been the end of it, but after doing his research into prostate cancer screening and diagnosis, Stiller realized he couldn’t be silent about his experience. He’s been spreading the same message ever since: “Taking the PSA test saved my life.”

This might not seem like a controversial statement—after all, it might seem hard to argue against a simple blood test that can identify prostate cancer early enough to treat it before it spreads and without major side effects. But in fact, due to recent chaos in the official recommendations for PSA blood testing, tens of thousands of American men are skipping the very test that possibly saved Stiller’s life on the advice of their doctors and with potentially devastating consequences.

History of Screening Recommendations

The PSA test is used to measure prostate-specific antigen, a protein that is produced by the prostate gland.

PSA levels rise in aging men and can be the first signal of underlying prostate cancer. So the PSA blood test is used to identify men who may have prostate malignancy and need further evaluation.

This simple blood test was approved by the FDA in 1994, allowing men to begin monitoring their PSA levels and identify possible tumors long before they become dangerous.1

Since PSA testing was introduced, the risk of dying from prostate cancer among men who were regularly screened declined by as much as 42%.2,3

Despite this drop, widespread PSA screening remained controversial in the medical community.

Prostate cancer is typically a slow-growing cancer, and the current biopsy and treatment methods, including the kind of less-invasive surgical removal that Stiller underwent, carry risks such as pain, incontinence and impotence. Some doctors worried that the PSA test, which can detect very slight increases in PSA levels, might be causing men with low-risk cancers to undergo biopsies and possibly unnecessary treatment.

Based on these concerns, in 2012, the US Preventive Service Task Force (USPSTF) issued a stunning update to prostate screening recommendations. Drawing its conclusions from the results of a $400 million federal study, the USPSTF advised against PSA screening for healthy men, saying that PSA screening has “no net benefit.”4-6 The American Cancer Society soon revised its recommendations, steering healthy, average-risk men away from PSA screening until age 50, with revised recommendations for men with a family history of prostate cancer.7

These guidelines caused immediate uproar in the medical community, including rebuttals from Life Extension urging men over age 40 to continue having annual PSA blood tests. By 2016, the USPSTF announced it was reconsidering its prior recommendations against PSA screening.
In 2017, a new draft recommendation was released for public input. This time, the USPSTF slightly backtracked, saying that the risks and benefits of PSA screening are “closely balanced” in men between the ages of 55 and 69 and they should seek their doctor’s advice on PSA screening. Men aged 54 and under and those over the age of 70 would still be counseled to avoid PSA screening. These new, slightly softer guidelines were still not finalized as of May 2017, and the agency was soliciting public input.8

In Stiller’s case, following even the updated guidelines might have meant disaster—he was still too young to be screened according to the USPSTF (United States Preventive Service Task Force). “If he [Ben Stiller’s doctor] had waited, as the American Cancer Society recommends, until I was 50, I would not have known I had a growing tumor until two years after I got treated,” he wrote. “If he [Ben Stiller’s doctor] had followed the US Preventive Service Task Force guidelines, I would have never gotten tested at all, and not have known I had cancer until it was way too late to treat successfully.”

The USPSTF’s original recommendations against screening were partly based on the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial. This huge trial assigned 76,685 men aged 55 – 74 years to one of two study arms. The first group (38,340 men) underwent annual PSA testing for 6 years and an annual digital rectal exam for 4 years. The control group (38,345 men) underwent normal care, with occasional “opportunistic screening” but no regular PSA monitoring. At the end of the 13-year follow-up period, researchers announced there was “no evidence of a mortality benefit” for annual PSA screening.9 The USPSTF recommendation against PSA screening soon followed.

Life Extension, which has long supported PSA screening, issued a detailed rebuttal challenging the findings of this study. In fact, the study was deeply flawed thanks to widespread “contamination” of the control arm.

While Life Extension was early in identifying the obvious flaws with this study, it wasn’t long until astute research groups began to catch up. In early 2016, a group of urologists from the New York Presbyterian Hospital and Weill Cornell Medical College in New York published a letter in the New England Journal of Medicine confirming what Life Extension suspected.10

The shocking truth was that more than 80% of the men in the control group—which was supposed to only receive “occasional” PSA screening—reported at least one PSA test during the trial. In fact, by some measures, the men in the control group received more PSA screening than men in the PSA screening arm10

Their conclusion? “We’re going to have to reconsider this issue.”11

Further support for this position was published in another large study, this one called the European Randomized Study of Screening for Prostate Cancer. This study randomized 182,000 men aged 50 to 74 to a “usual care” control group or a group with PSA screening every two to seven years. Spread across seven research centers in Europe, the group tracked prostate cancer mortality in both study arms. At the median follow-up of nine years, researchers reported that PSA screening resulted in a 20% reduction in prostate cancer mortality!12

A study from the Göteborg center, one of the seven participating centers in this study, found that men aged 50 to 64 years of age who had a PSA screening every other year had a 44% reduced mortality risk from prostate cancer. The center used a PSA cutoff of 2.5 ng/mL to 3.0 ng/mL. Men with these cutoff PSA levels and higher were referred for additional testing, including a digital rectal exam, transrectal ultrasound, and prostate biopsy.13

Although it’s too late to help the tens of thousands of men who likely skipped PSA screening, we are grateful the USPSTF is slowly grappling with the well-documented issues in its original guidelines by issuing the new draft recommendations.14
tragic finding: diagnoses of metastatic prostate cancer, the worst type, climbed an unbelievable 72% between 2004 and 2013.\textsuperscript{16}

To reach these findings, the group studied a database of more than three-quarters of a million men in the National Cancer Data Base. What they found should alarm any man who skips his PSA screening.

“The fact that men in 2013 who presented with metastatic disease had much higher PSAs than similar men in 2004 hints that more aggressive disease is on the rise,”\textsuperscript{17} said study author Dr. Edward Schaeffer, chair of urology at Northwestern University Feinberg School of Medicine and Northwestern Medicine.

“One hypothesis is the disease has become more aggressive, regardless of the change in screening,” said Dr. Schaeffer. “The other idea is since screening guidelines have become more lax, when men do get diagnosed, it’s at a more advanced stage of disease. Probably both are true. We don’t know for sure but this is the focus of our current work.”\textsuperscript{17}

This makes treatment more difficult, and it’s exactly the situation Ben Stiller would have faced if his forward-thinking doctor hadn’t established a PSA baseline early on and tracked it, allowing him to discover Stiller’s troubling increase in PSA levels over time and recommend the movie star for further evaluation and surgery.

It’s important to note that the increase in metastatic, aggressive prostate cancer almost perfectly aligns with the trend away from PSA screening that culminated with the USPSTF 2012 recommendation against any PSA screening.

Rise in Metastatic Cancer Rates

While various agencies continue to issue contradictory and confusing advice, men across the country have paid the price. In late 2016, a research group from Northwestern Medicine released a stunning and
PSA test when I was about 46,” he wrote in Medium, a popular blogging platform. “My doctor watched my PSA tests rise for over a year and a half, testing me every six months...I think men over the age of 40 should have the opportunity to discuss the test with their doctor and learn about it, so they can have the chance to be screened.”

More recently, two years after his diagnosis and treatment, Stiller went public with his experience with an interview with Matt Lauer on the Today show, alongside Dr. Schaeffer. While reporting that he wasn’t experiencing any of the major complications of prostate surgery, Stiller gave a simple reason for going public. He wanted to educate as many men as possible about their options when it came to PSA screening.

“It’s a whole new world,” Stiller said. “You need to educate yourself.”

We at Life Extension commend Bernard M. Kruger, M.D. for having the foresight to test Ben Stiller’s PSA blood levels despite conventional “authorities” advising against PSA screening.

The good news for all men is that newer imaging techniques, as described in the June 2016 issue of Life Extension magazine, are reducing biopsy side effect risk and enabling men to eradicate prostate cancer without major surgery and radiation.

### Prostate Cancer Survivors Due to Early Detection

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<td>Colin Powell</td>
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<td>Michael Milken</td>
<td>1993 at age 46</td>
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If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

### References

As you grow older, age-related stiffness and discomfort in the joints becomes a fact of life. Activities once routine become a challenge as limited mobility hampers your every move.

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

Non-GMO

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

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

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An Innovative Approach to Stopping Colds and Flu

The Centers for Disease Control and Prevention estimate that 56,000 people a year die from flu-related illnesses.¹ During the 2015-2016 flu season 310,000 people were hospitalized due to flu-related illnesses.²

Colds and the flu are often treated with a variety of medications designed to reduce symptoms but that have no ability to activate the body’s own immune response to fend off invading bacteria or viruses.

Scientists wanted to find a way to stop the common cold and flu before they take hold.

Our bodies have a built-in security system called secretory IgA, which is present in mucosal membranes that line the nose and upper respiratory tract. IgA can prevent cold and flu viruses from entering.

With age, our ability to generate IgA secretions declines and this first line of defense is weakened.

Researchers started their investigations knowing that a critical aspect of the immune system is the microbiome in the gut, where a complex microenvironment of beneficial bacteria exist and interact.

Scientists discovered that a targeted probiotic cocktail of bacteria can boost the body’s immune defense system, in particular mucosal secretory IgA.
How IgA Protects Against Cold and Flu

Infections of the nose and upper respiratory tract pose a risk to older adults, who have a reduced immune response.³

This weakening of the immune system arises in part from reduced production of secretory antibodies that protect the nasal mucosa and respiratory tract mucosal surfaces from viral infection.

The decline of protective IgA helps explain why aging adults can be susceptible to infection by cold and flu viruses, as well as the Streptococcus pneumoniae bacterium, a cause of bacterial pneumonia in aging adults.⁴

To counteract this problem, researchers tested a unique oral probiotic blend designed to reduce the risk of respiratory infections by enhancing secretory immunity.

The term “secretory immunity” refers to production of specialized antibodies like IgA in the mucous membranes lining the nose, and portions of the windpipe and lungs.⁵

The importance of IgA antibodies is that they target both viral and bacterial invaders in the upper respiratory tract, deactivating them and presenting them for destruction by the immune system.⁶ This prevents both cold and flu viruses from gaining a foothold in the body. These pathogens are stopped before wreaking havoc in the body’s respiratory tract.

Blocking viral attachment to mucous membranes, in turn, prevents viruses from injecting their genetic material into human cells, and hence from replicating to produce more viruses.⁶

IgA is the acronym for immunoglobulin A. Increasing IgA secretion and breaking a viral replication cycle can prevent development of colds, influenza, and other respiratory infections.

Probiotics Slash Respiratory Infections

Researchers have identified several unique strains of targeted probiotics that have potent preventive effects on human respiratory infections. Their weapon against microbes, especially viruses that target the respiratory tract, appears to be the stimulation of IgA.

To see how this unique probiotic blend works to prevent infection by cold and flu, let’s look at a human clinical study. The trial was performed over the course of 90 days during cold and flu season with 250 subjects.⁷

The subjects were randomly assigned to receive either a placebo or a mixture of five unique probiotic strains specifically formulated to stimulate protective IgA:

- L. plantarum (LP 01-LMG P-21021)
- L. plantarum (LP 02-LMG P-21020)
- L. rhamnosus (LR 04-DSM 16605)
- L. rhamnosus (LR 05-DSM 19739)
- B. lactis (BS 01-LMG P-21384)

During the course of the three-month study, subjects were asked to report all daily respiratory symptoms (runny nose, cough, fever, bronchitis, or pneumonia), along with the length and severity of symptoms.

All diseases accompanied by fever were classified as “flu-like syndromes,” while a separate category of “influenza-like illnesses” was also used. Other categories were “bronchitis-like” diseases, upper respiratory tract infections, common cold, and cough without other symptoms.

The study showed reduction in symptoms and reduction in the duration of symptoms.
The study findings showed:

- **16** episodes of “influenza-like illnesses” in the **placebo** group compared to **3** such episodes in the **probiotic cocktail** group (a significant **81% reduction**).

- **31** episodes of colds among placebo recipients compared to **20** reported cases in the **probiotic** group. This **35% reduction** did not quite achieve statistical significance.

- Cold duration fell from **6** days in placebo recipients to **4.7** days in the **probiotic** supplemented patients, a **22% reduction**.

- Cough duration fell in the patients given the **probiotic** cocktail from **7.3** to **4.5** days, a **39% reduction**.

- Total acute upper respiratory infections fell from **6.1** to **4.6** days in the **probiotic** group, a **25% reduction**.

A similar study showed a **48% reduction** in flu episodes on subjects using the **probiotic cocktail**. The number of days with flu symptoms decreased significantly by **55%**.

---

**What You Need to Know**

**Prevent Colds and the Flu With Oral Probiotics**

- Respiratory infections such as colds and the flu can be life-threatening for aging people.

- A major source of this age-induced susceptibility is the gradual loss of **secretory immunity**, mediated by secretory antibodies called IgA.

- IgA antibodies, secreted from mucous membranes in the mouth, nose, and lungs, bind to and block respiratory viruses from invading human cells and producing symptoms of colds and flu. But as their production fades, so does our immunity to these microbes.

- Recent studies have revealed the surprising fact that selected strains of oral probiotic bacteria are capable of stimulating the intestinal immune system, resulting in body-wide increases in secretory immunity.

- In the respiratory tree, this increase in IgA production leads to enhanced protection against cold and flu viruses.

- Studies have now demonstrated convincingly that supplementing with these strains of probiotic bacteria results in significant reductions in the incidence and duration of year-round respiratory infections.

- IgA is the acronym for **immunoglobulin A**.
A human clinical trial was conducted among healthy older adults (ages 60-74) who were randomly assigned to receive this probiotic or a placebo. Subjects took one capsule daily, containing two billion microorganisms per capsule.

Supplemented subjects experienced a significant 45% drop in the frequency of respiratory infections. Notably, a concomitant significant 45% increase in concentrations of IgA was demonstrated in their saliva, strongly suggesting that increased IgA was at least in part responsible for the observed impact. No significant side effects were noted in either group.

Adding *Bacillus Subtilis* CU1 to the Probiotic Cocktail

In another study, scientists identified a sixth probiotic that also provided immune-stimulating features among aging adults at risk for respiratory infections. This bacteria, *Bacillus subtilis* CU1, creates a natural protective shield that resists the acid in the stomach, promoting the probiotics’ survival into the digestive tract. Previous studies have shown that this strain of probiotic can stimulate IgA in humans, a mechanism of great interest in preventing respiratory infections.

Unleashing the Nuclear Bomb to Stop Colds and Flu

The importance of taking aggressive actions upon the first signs and symptoms of viral respiratory infections is critical. This protocol or “nuclear bomb” should be initiated within 24-48 hours of the manifestation of serious cold and flu symptoms.

1. **800 mg of cimetidine** (and higher). This drug is sold over the counter in pharmacies to combat heartburn, but its beneficial side effect is to boost immune function by reducing T-suppressor cells, thereby keeping the immune system active. Cimetidine can interact with prescription medications, so consult with a pharmacist and your physician before using. For most people, cimetidine provides immune system stimulation that is particularly effective against certain viruses.

2. **9,000 mg of high-allicin garlic** once or twice daily. This potent form of garlic will cause painful stomach-esophageal burning if you don’t eat food right afterward. Ingesting **9,000 mg** of this kind of garlic will cause you to reek of a strong sulfur odor, but saturating the body with it is the objective. Garlic has shown direct virus-killing effects in a number of published studies.

3. **200 mg of DHEA** early in the day. This is a high dose, but DHEA has shown some unique benefits in boosting one’s ability to mount a stronger immune response and also protecting against dangerous inflammatory cytokine responses that sometimes occur in response to viral infections.

4. **1,200 mg a day of lactoferrin**. This natural constituent of mother’s milk boosts natural killer-cell activity and can kill certain viruses.

5. Two **18.5-mg zinc acetate lozenges** every two waking hours. Please be aware that this is a very high dose of zinc and is considered toxic if taken over the long term. You should only do this for a few days. Zinc has shown a direct effect of inhibiting cold viruses from latching onto your cells.

6. **10-50 mg of melatonin** at bedtime (ordinarily, melatonin is taken at levels of just **1-3 mg** per evening). Melatonin induces a powerful immune response and this high dose can facilitate the deep sleep one often needs to fend off an infection. This dose of melatonin will make you extremely tired, so please only take this before bedtime and do not operate any machinery or vehicles after ingestion.

7. **3,600 mg a day of aged garlic extract**. There are unique immune-boosting compounds in aged garlic that work differently than those found in high-allicin garlic.

8. As discussed on the sidebar on page 45, the prescription drug **Tamiflu®** in the dose of **75 mg** twice a day should be started within 24 hours of flu symptoms manifesting to block entry of certain viruses into cells where they multiply.

Do not delay in implementing the above regimen. Once a flu virus infects too many cells, it replicates out of control and strategies like zinc lozenges will not be effective. Treatment should be initiated as soon as possible after symptoms manifest!
The Importance of Dendritic Cells

How can ingestion of a probiotic lead to increased secretion of IgA in the nose and throat? IgA production can be stimulated or reduced throughout the body, depending on the environment sensed by specialized cells called dendritic cells. Dendritic cells can detect molecular patterns on the surfaces of the billions of bacteria and viruses we swallow every day, whether they enter our bodies through the mouth or the nose.

Once dendritic cells have encountered these microbial identifiers, they “teach” other immune system cells about the nature of the threat, prompting them to pump out IgA, among other defensive molecules.

IgA is secreted throughout the body, including mucous membranes of the mouth and nose. Increased IgA in those areas results in increased protection against invaders attempting to enter the body through those membranes.

Studies have demonstrated that orally-ingested probiotics stimulate IgA in the mucous membranes of the bronchi (larger air tubes in the lungs). Similarly, probiotics have been shown to reduce the incidence and severity of respiratory infections in children.

When Influenza Turns Deadly:
Life-threatening Influenza Requiring Hospitalization

Those over the age of 65 as well as aging individuals with chronic diseases that may weaken the immune system, cardiovascular system, and/or respiratory tract (e.g., diabetes, cardiovascular, and chronic lung disease) are at higher risk of developing potentially life-threatening infections including the dreaded influenza pneumonia that is linked to a high mortality rate.

In contrast to younger and generally healthy patients, these high-risk patients may not necessarily manifest a high fever initially (a body temperature in excess of 102.5 degrees Fahrenheit) since impaired thermoregulation is observed with aging.

Headache, dramatic fatigue, muscle aches, a non-productive cough (initially), and nasal congestion are important signs and symptoms of influenza infection in older patients. Additional signs and symptoms in older patients may include cognitive dysfunction and confusion, difficulty walking, and falls.

Worrisome signs and symptoms for patients with influenza infection suggesting pneumonia include:

- Respiratory rate above 25 breaths per minute, reflecting difficulty with oxygenation
- Hypotension (blood pressure below 90/60 mm Hg)
- Bloody sputum

Labs tests that also suggest severe disease include:

- Elevated lactate dehydrogenase (LDH)
- Elevated creatine phosphokinase (CPK)
- Hypoxemia (the inability to oxygenate the blood) increases rapidly to the point of respiratory failure in many of these patients requiring mechanical ventilation, often after only 24 to 48 hours.

The most important pharmacologic intervention to reduce the risk of death in these patients, in addition to cardiovascular and respiratory supportive measures, is rapid identification of viral strain, and rapid antiviral treatment with neuraminidase inhibitors, e.g., oseltamivir (Tamiflu®) and zanamivir (Relenza®), initiated as soon as possible, ideally within 24 hours.
Thus, orally ingested probiotics appear capable of sealing the age-induced gap in secretory immunity that puts so many older adults at grave risk for respiratory infections every year.

The discovery of the unique IgA-stimulating properties of oral probiotics opens a new world in modulation and strengthening of our aging immune systems, and provides a new weapon in our battle against respiratory illness.

Summary

A cold or flu can pose serious risks for aging adults. Such infections can lead to potentially fatal bacterial infections, particularly pneumonia, which kills more than 50,000 Americans annually.14

One main source of the age-related increase of viral respiratory infections is the loss of secretory immunity, which is controlled by a class of antibodies known as IgA.

As aging adults lose IgA protection, they lose their ability to defend against viruses attacking the mucous membranes in the nose, lungs, and bronchi of the respiratory tract.

Specific strains of probiotic bacteria, ingested orally, have the ability to stimulate IgA production in the respiratory mucous membranes, thereby preventing attachment by, and infection with, common viruses. Human studies demonstrate that supplementation with the proper blend of probiotic strains reduces the incidence of colds and flu-like illnesses, an effect largely attributable to increases in levels of IgA.

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

References

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MEGA BENFOTIAMINE
SUPPORTS HEALTHY BLOOD SUGAR METABOLISM

Item # 00925 • 120 vegetarian capsules

Retail Price Your Price
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By activating cell signaling pathways, geroprotectors represent a new way to advance healthy aging strategies.

Just one Geroprotect™ Ageless Cell™ softgel daily provides:

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- N-Acetyl-L-Cysteine 450 mg
- Epigallocatechin Gallate [EGCG] 100 mg
- Gamma tocotrienol 25 mg

Geroprotect™ Ageless Cell™
Item #02119 • 30 softgels

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

Consult your healthcare provider before use if you have a bleeding disorder, are taking anticoagulant or antiplatelet medications or beta-blockers such as Nadolol. Keep out of reach of children. Do not exceed recommended dose.

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- Support healthy blood sugar levels²
- Enhance heart health³
- Boost brain function⁴
- Support strong bones⁵
- Maintain healthy cholesterol levels already within normal range⁶

Each cost-effective bottle lasts over three months!

Mega Green Tea Extract Decaffeinated
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Non-GMO

Mega Green Tea Extract Lightly Caffeinated
Item #00953 • 100 vegetarian capsules

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Non-GMO

References

Note: EGCG is the acronym for epigallocatechin gallate, which is the polyphenol in green tea that has demonstrated the most robust health benefits.

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

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**Pu-erh tea**
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**Reishi**
- Helps reduce biomarkers of immune senescence.

For full product description and to order Immune Senescence Protection Formula™, call 1-800-544-4440 or visit www.LifeExtension.com

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Item #02005 • 60 vegetarian tablets

References

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Relieve Urinary-Tract Symptoms by Boosting Prostate Health

More than 50% of men in their 60s and as many as 90% of men in their 80s suffer lower urinary-tract symptoms related to prostate enlargement.¹

Common problems include urinary frequency, urgency, and weak stream. Over time, these urinary challenges can cause bladder infection, kidney stones, kidney damage, and erectile dysfunction.²⁻⁴

Frequent nighttime urination also results in chronic sleep deprivation—increasing the risk of heart attack,⁵⁻⁶ cancer,⁷⁻⁸ depression,⁹ inflammatory syndromes,¹⁰⁻¹¹ and death.¹²

In lieu of drugs, European physicians have for decades prescribed natural plant extracts to alleviate urinary discomforts associated with benign prostate enlargement (BPH). Efficacy of these plant extracts has been demonstrated in a number of published medical studies.

Scientists have found that combining different plant extracts works better to alleviate prostate discomfort.
Saw Palmetto berries (Serenoa repens) was long ago shown to improve symptoms associated with an enlarged prostate.

Some studies suggest it helps relieve BPH symptoms as well as finasteride and tamsulosin,31,32 minus the sexual dysfunction associated with these drugs.31

One study found that 320 mg of saw palmetto extract daily improved the International Prostate Symptom Score of elderly men by 52% and their sexual dysfunction scores by 40%.32 Another review demonstrated saw palmetto’s efficacy, especially for men with mild-to-moderate BPH symptoms.33

Two large meta-analyses showed that saw palmetto extract improved the International Prostate Symptom Score, reduced nighttime urination frequency, and improved peak urine-flow rates.34,35

An underlying reason for these effects is that saw palmetto is rich in bioactive compounds—including beta-sitosterol—that support the aging prostate. One mechanism is to impede the adverse effect of dihydrotestosterone (DHT) on prostate cells. DHT is a hormone that increases prostate growth.36 Blocking DHT receptors on prostate cells reduce DHT’s potential negative impact.37

Not all studies on saw palmetto by itself demonstrate clinical benefits.38 For this reason, plant-based prostate formulas today include additional botanical extracts, and many are prescribed in Europe as “drugs” to alleviate urinary symptoms.
**Nettle Root**

*Urtica dioica*, or *stinging nettle root*, has been shown to shrink the prostate and relieve BPH symptoms.39-41

One study showed that nettle root extract improved lower urinary tract symptoms significantly better than placebo, with marked *improvements* in the *International Prostate Symptom Score*, increases in *peak urinary flow rates*, and reductions in *urine volume* remaining in the bladder.41

Other compelling research found that the combination of nettle root and saw palmetto extracts results in improvements that are similar to those of prescription BPH medications, but with substantially fewer adverse events.42-44

Scientists demonstrated that stinging nettle combined with saw palmetto reduced nighttime urination by *one episode* nightly, a significant difference.43 And, in elderly BPH patients, this combination reduced the International Prostate Symptom Score by 53%, improved urinary flow by 19%, and reduced residual urine volume 44% compared to placebo.45

While producing improvements similar to BPH drugs, this combination (nettle root and saw palmetto) results in far fewer adverse events.42,44

**Pygeum Africanum**

*Pygeum africanum* is a plum tree in tropical Africa, and an extract derived from this tree has been widely used in Central and Eastern Europe for decades. Numerous human studies have demonstrated the clinical efficacy of *pygeum extract* in the management of mild to moderate BPH.46,47

Pygeum extract has been shown to improve International Prostate Symptom Scores by 38%-46%,47 reduce the frequency of nighttime urination by 32%,46 and raise peak urinary flow rates by 16%-19%,47—all at typical doses of 100 mg per day.

In two different studies, scientists demonstrated that pygeum extract improves quality of life—a critical factor in this condition—by about 30%.46,47

In a meta-analysis of 18 randomized clinical trials that involved a total of 1,562 men, researchers found that *pygeum extract* reduced nocturnal urination by 19% and increased urine flow by 23%. Pygeum use also resulted in a critical reduction in the volume of urine remaining in the bladder after urination, which decreases the risk of urinary tract infections. The extract was also found to more than double the odds of a man reporting an overall improvement in urinary tract symptoms compared to men using a placebo.48

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**What You Need to Know**

**Naturally Treat Urinary-Tract Symptoms**

- BPH causes lower urinary tract symptoms in aging men and can result in serious complications, including bladder infections, kidney damage, and erectile dysfunction.
- It involves frequent nighttime urination that results in chronic sleep deprivation, in turn increasing the risk of heart attack, cancer, depression, inflammatory syndromes, and death.
- Several natural extracts have been found to safely shrink an enlarged prostate—as well as improve many of the unpleasant symptoms associated with BPH.
Rye Flower Pollen Extract

Rye flower pollen extract reduces lower urinary-tract symptoms by selectively inhibiting the growth of prostate cells and effectively treating BPH.49-53 Confirming early findings,50-53 scientists treated 79 BPH patients (ages 62 to 89) with 126 mg of pollen extract three times daily for at least 12 weeks. Maximum urine-flow rates increased about 18%, average urine-flow rates increased nearly 18%, and residual urine volume (urine left in the bladder after voiding) plummeted 45%. Those taking the extract beyond one year experienced an average decrease in prostate volume of about 20%, without adverse reaction.54

A subsequent review revealed that BPH patients who were treated with pollen extract were 2.4 times more likely to experience improvement and over two times as likely to reduce nighttime urination as the placebo group.55

Pollen extracts have also demonstrated an ability to suppress prostatitis and prostatodynia (chronic pelvic pain). In early human studies, pollen extracts eliminated these conditions from many patients.56,57 This is exciting, given how difficult these conditions are to treat.

One study divided 90 chronic prostatitis patients into two groups, one without related complicating factors and one with complications such as prostate stones or bladder-neck narrowing. All took pollen extract three times daily for six months.57 In the group without complicating factors, 78% had a favorable response in their symptoms and 36% experienced complete elimination of symptoms. Patients in the group with complicating factors did not respond as well,57 suggesting that pollen extract is most useful in patients who lack complications.

Landmark research showed that pollen extract may help patients for whom no standardized treatment exists. Patients with inflammatory prostatitis/chronic pelvic pain syndrome received pollen extract for 12 weeks. Over 70% of supplemented patients showed at least a 25% improvement in their NIH Chronic Prostatitis Symptom Index score.58

Flower pollen extract was shown to improve the quality of life of patients with chronic prostatitis or chronic pelvic pain syndrome better than ibuprofen,59 without severe side effects.59,60

Pumpkin Seed

Pumpkin seeds have been used in traditional medicine for generations to treat prostate issues. Now, modern medicine is confirming their ability to reduce prostate size as well as improve symptoms associated with enlarged prostate.

A 2016 study on hyperplastic (proliferated) cells from prostate tissue showed that pumpkin seed extract safely inhibited cell growth by a remarkable 40%-50%.61 The study author concluded that this “corroborates the (traditional medicine) use of pumpkin seeds for treatment of benign prostate hyperplasia.”61

Clinical studies have shown that pumpkin seed and pumpkin-seed oil significantly decreased International Prostate Symptom Scores within 3-12 months.62,63
In 2016, researchers conducted a review of studies related to lower urinary tract symptoms and BPH and found that all six clinical studies demonstrated that pumpkin seeds led to improvement in International Prostate Symptom Score and in volume and speed of urinary flow.64

**Flaxseed**

BPH patients who took flaxseed lignan extract experienced improvements in International Prostate Symptom Score and life-quality scores.65 In a 2017 study of animals with induced BPH, a flaxseed diet was shown to reduce the thickness of the prostate epithelium, the outer layer of the prostate surface.66

**Summary**

The life-disrupting, lower urinary-tract symptoms of BPH affect aging men and can lead to complications such as bladder infections, kidney damage, and sexual dysfunction.

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**Natural Prevention of Prostate Cancer**

**Prostate cancer** is the second most common malignancy among men,67 with more than 160,000 American men expected to be diagnosed in 2017, according to the American Cancer Society.68 It is also one of the most preventable cancers—because it tends to be very slow-growing and nutritional approaches can be highly effective.69 The following is a list of nutrients that have been found to protect against the development of prostate cancer.

**Lycopene:** High consumption of lycopene—the carotenoid pigment abundant in tomatoes and other red fruits and vegetables—delivers potent effects against prostate cancer and is associated with a 59% lower risk of dying from more aggressive prostate cancers.70-73 One 2016 clinical trial on 79 prostate cancer patients demonstrated that lycopene-rich tomato products significantly decreased PSA compared to controls.74 By suppressing critical “master regulatory molecules,” such as nuclear factor-kappa B (NF-κB), lycopene inhibits inflammatory processes that promote prostate—and many other—cancers.75

**Pygeum:** Research demonstrated that administering the bark extract of *Pygeum africanum* to mice specifically bred to develop prostate cancers significantly lowered their risk of developing this malignancy. Pygeum applied directly to prostate cancer cells in culture inhibited cell proliferation, induced apoptosis, and bound to androgen receptors used by the tumor to sustain growth.69 When serum taken from a man who was supplementing with pygeum extract was applied to prostate cells in culture, it decreased proliferation of prostate cells and upregulated genes involved in tumor suppression.76

**Boswellia extract:** When an extract of *Boswellia serrata* is applied to cultured prostate-cancer cells, it induces apoptosis.77-80 Research showed that boswellia components may prevent tumor growth by blocking receptors for androgen, the male hormone,81 and by inhibiting the formation of new blood vessels (angiogenesis) which further deprives tumors of nutrients.54

**Flaxseed:** Scientists demonstrated that flaxseed lowers PSA levels and significantly reduces proliferation of both normal and cancerous prostate cells.82,83 In a clinical study, flaxseed reduced tumor proliferation rates in prostate cancer patients in as few as 30 days.82

**Boron:** Men with the highest dietary boron intakes have a 54% lower risk of prostate cancer compared to those with the lowest intake.84 Boron blocks growth factors necessary for tumor development and inhibits the enzymatic action of PSA.85 Human prostate cancers implanted in mice were smaller by 38% following low-dose boron supplementation while serum PSA levels fell 89%.85

The frequent nighttime urination associated with BPH also results in chronic sleep deprivation, which has been shown to boost the odds of heart attack,5,6 cancer,7,8 depression,9 inflammatory syndromes,10,11 and death.12

Abundant research demonstrates that a number of prostate-specific plant extracts can improve many of the symptoms associated with an enlarged prostate—and may also reduce prostate gland volume without significant side effects.●
If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

**References**


Top Off Your TESTOSTERONE Naturally


Maintaining healthy testosterone levels helps men regain health and improve performance.

By the time a man is 70 years old, he may produce 60% less testosterone than he did at age 40.* The time is now to add Super Miraforte with Standardized Lignans to your supplement regimen.

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- Less Energy
- Cloudy Thinking
- Weight Gain
- Cardiovascular Issues

Elevations in free testosterone can unmask an occult (hidden) prostate cancer. Anyone with this concern should have a baseline PSA prior to using this product and a follow-up PSA test 60 days later. If a significant elevation of PSA is found, discontinue this product and advise physician. Do not take more than 15 mg per day of Bioperine®.

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

Retail  Your
Price  Price
1 bottle  $62  $46.50
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Caution: If you are taking any medication, use only under physician supervision. Men with existing prostate cancer may not be able to use this product.

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As a man ages, maintaining a healthy prostate is key. We created Ultra Natural Prostate to help you maintain prostate health, so you can focus on what’s important. With over a dozen natural ingredients, this supplement promotes healthy prostate function, supports easier urination, inhibits inflammatory factors, and encourages natural division of prostate cells. Ultra Natural Prostate. The most comprehensive prostate health supplement.
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For full product description and to order BioActive Complete B-Complex, call 1-800-544-4440 or visit www.LifeExtension.com

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Item #01945 • 60 vegetarian capsules

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Glaucoma is one of the leading causes of blindness, affecting approximately **2.7 million** Americans.¹

In the past year, studies have found new links between glaucoma and a host of diverse risk factors, such as tooth loss,² obstructive sleep apnea,³ genetic predisposition⁴ and potentially diabetes.⁵ Drugs such as corticosteroids are also implicated in glaucoma risk.⁶

The most common risk factor for glaucoma is **increased pressure in the eye**, which can cause irreversible damage to the **optic nerve**.⁷

There is usually no pain associated with increased eye pressure,⁸ which means you could be at risk for glaucoma—*and not even know it*.

But while glaucoma itself is irreversible, studies have shown that it is possible to prevent—or even **reverse**—the major underlying cause.

In a human study, a proprietary extract of French **maritime pine bark** combined with **bilberry** extract reduced eye pressure by as much as 24%—with reductions of 40% when combined with standard therapy.⁹
A Vision-Robbing Disease—Without Warning Signs

People who are developing glaucoma generally have no symptoms. They feel no pain.\(^8,10\)

One day their vision is normal, the next they begin to realize that they are missing some objects that would normally fall within their peripheral vision. At this first sign, the progression that may eventually lead to blindness is well underway.\(^10\)

In most cases, glaucoma occurs when fluid builds up, creating abnormal intraocular pressure within the eye. Over time, this pressure damages the retina and the optic nerve, resulting in reduced visual acuity and possibly leading to blindness.\(^11\)

What Causes Increased Eye Pressure?

The transparent fluid that fills the anterior part of the eye between the lens and the cornea is called aqueous humor.\(^12\) This fluid has numerous jobs, including providing nutrition to the anterior part of the eye and transporting the metabolic debris produced there to the bloodstream so that we can see clearly.

The appropriate production, circulation, and drainage of this fluid are essential for eye health.

Open angle glaucoma, which is diagnosed in at least 90% of glaucoma patients, is the most common form of the disease.\(^13\) Over time, the drainage channels become blocked, fluid builds up, and intraocular pressure rises.\(^10\)

Additionally, endothelial dysfunction and vascular structural changes can substantially alter blood flow within the tissues and elevate intraocular pressure, leading eventually to open angle glaucoma.\(^14\)

Whether or not you develop glaucoma as a result of increased intraocular pressure depends on the level of pressure your optic nerve can tolerate without being damaged.\(^10\) However, once the optic nerve is damaged, it can’t be repaired—even if the raised intraocular pressure is corrected.\(^15,16\)

This makes it extremely urgent to find a way to reverse high intraocular pressure before it causes the irreversible damage of glaucoma.

The Search for a Solution

Scientists turned to past research to find the best possible natural candidates for treating this condition. Their search led them to French maritime pine bark and standardized bilberry extract.

Previous studies had shown that these extracts could successfully counteract retinopathy, which is persistent or acute damage to the retina.\(^9,17\) This led investigators to examine the usefulness of these plant extracts in countering the drivers behind increased intraocular pressure.

What they found was that French maritime pine bark could improve the function of the endothelium, the delicate layer of cells lining the blood vessels. Disorders of endothelial function are contributing factors to the development or progression of glaucoma.\(^9,14\)

Other studies showed that bilberry extract could counteract hyperpermeability of the ciliary capillaries. The beneficial effect is significantly increased ocular blood flow, resulting in reduced intraocular pressure.\(^17\)

It became clear that these two extracts may work together to:

- Decrease inflow of aqueous humor;
- Improve microvascular tone and integrity;
- Decrease resistance across the region of the eye responsible for fluid drainage, and possibly;
- Contribute to better fluid outflow.

The ability of both bilberry and French maritime pine bark to target critical aspects of increased eye pressure led scientists to formulate a compound that combined these two. The next step was to conduct human studies that tested the dual-extract formulation.
Remarkable Drop in Eye Pressure

In an initial controlled study of this dual compound, scientists measured blood flow in the eyes of 38 volunteers who had high intraocular pressure but who had not yet shown evidence of glaucoma. One group took the pine bark-bilberry compound orally for six months and the second group did not.17

At three months, the group taking the pine bark-bilberry compound showed a statistically significant 13% reduction in intraocular pressure. Compared to untreated participants, the treated group also had improved ocular blood flow in three different blood vessels.17

A follow-up study showed that taking the same pine bark-bilberry compound for longer led to even greater improvements.

In this study, 79 individuals with intraocular pressure who had not yet shown signs of open angle glaucoma were divided into three groups:

1. The first group received the pine bark-bilberry extract,
2. The second group received standard medical therapy with latanoprost (Xalatan®) eye drops,
3. The third group received both the pine bark-bilberry compound and the latanoprost drops.9

All three treatment groups demonstrated a reduction in intraocular pressure. Subjects using the prescription eye drops lowered their eye pressure by an average of 28%, beginning from the fourth treatment week. Those participants taking the pine bark-bilberry formulation reduced their eye pressure significantly beginning in the sixth treatment week and throughout the study, leading to a 24% reduction in the sixteenth week—comparable to the drug, but with a better safety profile.9

But by far, the most compelling results were seen in the group that used the combination of pine bark-bilberry formulation and the latanoprost drops. A significant, average reduction in intraocular pressure of 28% began at four weeks—but when the study ended at 24 weeks, the decrease in eye pressure had reached an approximate 40%!9

The pine bark-bilberry compound appeared to have an additive effect with the latanoprost drops to amplify the reduction of intraocular pressure better than either agent alone.9

Critically, the subjects experienced a significant increase of ocular blood flow.9

The study author noted that, “No serious side effects occurred during the study, apart from standard side effects in patients related to latanoprost.”9

What You Need to Know

Preventing Glaucoma

- Glaucoma is one of the leading causes of blindness in the US.
- The most common risk factor behind glaucoma is an increase in intraocular pressure, which can damage the optic nerve.
- While glaucoma itself is irreversible, it is possible to prevent or reverse the increased intraocular pressure that can cause it.
- Clinical studies have shown that increased eye pressure can be lowered by 24% with a proprietary extract of French maritime pine bark and bilberry extract and—when combined with standard therapy—by a compelling 40%!
French Maritime Pine-Bark Extract

Numerous studies have given us insight into why these two extracts have such beneficial effects on eye pressure.

Each extract has its own range of actions that appear particularly suited to aiding the complex balance at the level of the eye chambers.9

**French maritime pine bark** is rich in plant-based **proanthocyanidins** and was found to have numerous biologic effects, including:

- The scavenging and neutralization of harmful free radicals,
- Regulation of the cell’s antioxidant network and associated genes,
- Anti-inflammatory effects (through the dampening of gene expression related to the nuclear factor-kappaB-dependent pathways inside cells),18,19
- Improved vascular endothelial function,20 and
- Improved microcirculation from antiplatelet effects and clot-formation prevention.21,22

One 2015 study appeared to show beneficial effects on intraocular pressure when volunteers were given **French maritime pine bark** combined with extracts of blueberry and green tea.23

French maritime pine bark’s powerful antioxidative capacity—which can protect the eye’s drainage system—is mirrored in the strong, free radical-quenching effects of bilberry extract.

Standardized Bilberry Extract

Bilberry (**Vaccinium myrtillus**) and other related berries are known for superior free radical-scavenging activity as well as genetic signaling ability.24 Bilberry has been shown to bolster the body’s defense systems against dangerous oxidative stress,25 and it has also been shown to be beneficial in atherosclerosis.26

Specifically using tissue from the pigmented layer of the retina, scientists found that bilberry positively influenced beneficial pathways involved in the antioxidant response effort.25

Bilberry has also been shown to provide protective effects in other models of inflammatory disease such as uveitis in a dose-dependent manner.27

A Significant Step Toward Prevention

Even with standard medical or surgical therapies, some glaucoma patients still progress to vision loss.8 Unfortunately, this loss is permanent. Until a cure is found, research is urgently needed to identify ways to prevent this devastating disease.

There currently is no accepted preventive strategy for glaucoma. The best defense to date involves rigorous and regular eye examinations by a trained professional.
However, delicate eye tissues—under assault by environmental toxins and cellular byproducts associated with aging—can greatly benefit from nutritional and other therapeutic support against glaucoma and other sight-robbing diseases.²⁸

The human studies described in this article are promising and mark an important initial step toward finding ways to prevent glaucoma. The dual-extract formulation of pine bark and bilberry has been shown to lower intraocular pressure by almost 40% in conjunction with prescribed eye drops that do involve some risk.³⁹

While this may bring hope to those with elevated eye pressure, it is important to note that high intraocular pressure may not always be the defining characteristic for diagnosing glaucoma or predicting whether the disease will worsen.³⁰ Statistics show that 15% of patients with characteristic glaucomatous nerve damage have intraocular pressure measurements that fall within the normal range.³¹ Such cases may be partly due to poor blood flow to the optic nerve.³²

Until a cure is identified, greater research into prevention strategies is needed.

**Summary**

Increased pressure in the eye is the most common underlying cause of glaucoma, and it usually occurs without pain or other warning signs.

Human studies demonstrate that increased intraocular pressure can be significantly reversed with a proprietary extract of French maritime pine bark and bilberry extract.

In a human study, this formulation reduced eye pressure by 24% and—when combined with standard therapy—by up to 40%!

While there is no cure for glaucoma, the pine bark-bilberry formulation we have described appears to represent a substantial breakthrough along the road to even greater preventive or curative discoveries.

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

**Understanding Glaucoma**

The term “glaucoma” refers to a common group of similar conditions that damage the retina and optic nerve, leading to visual impairment. There are many risk factors for glaucoma that range from genetics and age to lifestyle factors.

Increased intraocular pressure is by far the most significant factor, and the one most associated with glaucoma. In general, those aged 60 and older are at a higher risk of developing glaucoma regardless of increased intraocular pressure. Amongst ethnic groups, African-Americans have the highest risk for glaucoma in the US. In addition, individuals with history of high blood pressure or diabetes are also at an increased risk. Certain medications, like corticosteroids also increase the risk of glaucoma.³³

It is important to note that normal tension glaucoma can develop in the absence of increased intraocular pressure and cause optic nerve damage. People with family history and those of Japanese ancestry are at a higher risk for this type of glaucoma.³⁴
References

1. Available at: https://www.cdc.gov/visionhealth/research/projects/ongoing/glaucoma.htm
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Pomegranate Improves Markers of Aging

Pomegranate’s heart benefits have led researchers to investigate in what ways this red fruit can keep us healthy.

In a recent finding, Swiss researchers have identified a new molecule that results from digesting two compounds found in pomegranates: punicalagins and ellagitannins. This unique molecule, known as *urolithin A*, helps rejuvenate *mitochondria*, our cellular powerhouses.¹

**Urolithin A** opens the door to potential new therapeutic treatments against age-related disorders, including **frailty**, which is a risk factor for disability, hospitalizations, and mortality.²
Next, the team performed several rodent studies and found that urolithin A improved muscle function and removed damaged mitochondria before they accumulate and cause cellular dysfunction throughout the body. Scientists know that with age, mitochondria lose their strength and die off thereby “clogging up” cells with debris that impedes their function.

In the first mouse study, urolithin A administration over the long-term was found to increase muscle function of aging mice. Compared to the control group, the supplemented group showed a 57% increase in the level of spontaneous exercise measured by the running wheel and a 9% increase in grip strength.1

In a second mouse study, this time involving a shorter treatment regimen on aged mice, urolithin A was found to increase running endurance by an average of 42%.1

Following these findings on aging mice, the team performed another study, also evaluating the impact of urolithin A on muscle function in young rats. Muscle function was evaluated by measuring voluntary running in activity wheels. Once again, treatment with urolithin A proved to be effective, this time by increasing the running capacity by 65% compared to controls.1

The administration of urolithin A resulted in an enhanced exercise capacity in young and older rodents. Muscle strength increased and running endurance was robustly augmented. Together, these different studies highlight that the administration of urolithin A, both short- and long-term, improved muscle function throughout different stages of life by improving muscle quality.

What is Urolithin A?

Urolithin A is produced by the body after ingesting compounds found in pomegranate such as punicalagins and ellagitannins and can help recycle defective mitochondria.

What A New Study Showed

Researchers first studied Urolithin A on a common worm called C. elegans. This worm is often used in anti-aging studies because after just 8-10 days it’s considered elderly. Its short lifespan allows scientists to observe and measure the effects of aging in a little over a week.

The researchers administered urolithin A to a group of these worms and noted that lifespan in the urolithin A group increased by more than 45% compared to the control group.1

Over time, the constant strain of energy production takes a toll on the mitochondria and energy output declines. At this point, these mitochondria function poorly and are basically useless. In young, healthy cells, the drop in performance of the mitochondria is identified by the body and the mitochondria are swiftly broken down, disassembled, and eliminated in a process called mitophagy. In this way, defective or less-than-optimal mitochondria are eliminated, giving room to new mitochondria and ensuring that optimal cellular function is maintained.

With age, our cells struggle to recycle defective mitochondria, leading to a progressive build-up of malfunctioning mitochondria that take up valuable space in the

Translating these Findings into Humans

...
body’s cellular system. This mitochondrial degradation affects the health of the cells, gradually weakening tissues. This process has been suspected of playing a role in many disorders of aging, such as Parkinson’s disease.¹

In humans, the inability to remove these useless mitochondria in skeletal muscle has been linked to reduced mobility in the elderly.¹ The progressive decline of muscle function contributes to a progressive state of generalized frailty.

In addition, the frailty associated with old age is an important risk factor for disability, hospitalization and mortality.² Thus, the muscle weakness seen in the elderly might be due to an increase in the accumulation of useless mitochondria. Results from the rodent studies strongly suggest that improvement of muscle quality may be achieved by enhancing mitochondrial function with urolithin A.

The results from these recent Swiss studies suggest that supplementation with pomegranate extract to boost the body’s content of urolithin A may be an innovative approach to maintaining healthy mitochondrial and muscle function.

Encouraged by their initial findings, the study authors are currently conducting clinical trials testing a special delivery method of finely calibrated doses of urolithin A in humans. These trials are currently taking place in a number of hospitals across Europe.⁴

Urolithin A Helps Fight Cancer

Despite aggressive surgical care and chemotherapy, nearly 50% of people with colorectal cancers develop recurrent tumors.⁵ This may be due in part to the survival of dangerous colon-cancer stem cells that resist conventional chemotherapy and act as “seeds” for subsequent cancers.⁶

In an interesting finding, researchers exposed colon-cancer stem cells from a patient with colorectal cancer to either a mixture containing 85% urolithin A or 30% urolithin A. The results were impressive. The higher urolithin A concentration mixture was most effective at inhibiting the number and size of colon-cancer stem cells and inhibiting the activity of aldehyde dehydrogenase, a marker of chemoresistance.⁷

This therapeutic approach is exciting because traditional therapies against cancer lack the ability to kill or stop the proliferation of cancerous stem cells. These new findings support the notion that a nutrient approach may prove valuable as an alternative treatment or preventive intervention for targeting these harmful cells.

Neuroprotective Effects

The connection between pomegranate and its neuroprotective effects against Alzheimer’s disease has been well established in animal studies.⁸ However, the bioactive constituents for this action were unknown until now.

Alzheimer’s disease is expected to affect over 115 million people worldwide by the year 2050.⁹ A group of researchers looked at a previous animal study that reported on the anti-Alzheimer’s effects of pomegranate extract constituents.⁸

The team evaluated the ability of these components to cross the blood-brain barrier and found that a methylated form of urolithin A (mUA), derived from pomegranate, along with other urolithins were capable of doing so.
And, although more research is needed, the authors concluded that urolithins are the possible compounds responsible for the anti-Alzheimer’s effects that include protection against neurotoxicity and β-amyloid fibrillation. These results are promising, and suggest the need for exploring other naturally-based dietary intervention strategies for preventing or slowing down the progression of Alzheimer’s.

The results and data from these various studies further support the importance of polyphenol metabolite compounds like urolithin A from pomegranate and their role in the fight against colon cancer and neurodegenerative diseases.

Summary

The discovery of urolithin A, that results from the punicalagins and ellagitannins compounds found in pomegranates, provides new opportunities to fight age-related decline of mitochondrial function and the resulting frailty and loss of muscle.

By helping cells renew themselves and optimizing muscle performance, pomegranate extract and its newly identified metabolite, urolithin A—could prove successful.

Along with these findings, there is supportive evidence of the powerful effects that urolithin A has against Alzheimer’s disease and cancer, offering yet another tool to fight against these devastating conditions that affect many aging individuals.

This nutritional approach opens up possibilities that traditional pharmaceutical approaches have never explored.

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

References

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*C J Diet Suppl. 2011 Jun; 8(2):158-68

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2017 Cardiovascular Disease Prevention Symposium
The best way to prevent cardiovascular disease (atherosclerosis, high blood pressure, heart attack, stroke, etc.) is with a healthy lifestyle—eat healthy foods, exercise, don’t smoke, and don’t gain weight.

For many people this lifestyle is too difficult or troublesome. Physicians attempting to encourage this lifestyle are often not successful and must resort to drugs.

Drugs are usually effective in reducing blood pressure. Statin drugs lower LDL and total cholesterol. One in four Americans age 45 and over takes a statin.¹

Blood plasma is 92% water. Water and oil don’t mix, so in order to transport fat in the bloodstream from the liver to body tissues, fats must be bound to lipoproteins. The two main forms of fat transported in the bloodstream by lipoproteins are triglycerides and cholesterol.

Two predominant lipoprotein particles are LDL (low density lipoprotein) and HDL (high density lipoprotein). Cholesterol attached to LDL (LDL cholesterol) is often called “bad cholesterol,” because the LDL particle can deposit the cholesterol behind blood vessel walls, causing atherosclerosis.

HDL cholesterol is called “good cholesterol” because the HDL particle transports cholesterol back to the liver. This classification is misleading because both LDL and HDL can be either beneficial or harmful, depending on particle size, oxidation, and other factors.

Statin drugs reduce plasma levels of LDL cholesterol by inhibiting cholesterol formation in the liver.

PCSK9 is a naturally occurring human enzyme that causes LDL receptors to be degraded. If PCSK9 activity is blocked, more LDL receptors will be present on cells to remove LDL cholesterol from the blood. This results in decreased levels of blood LDL cholesterol. (PCSK9 stands for “Proprotein Convertase Subtilisin Kexin9.”)

PCSK9 inhibitors are a new and expensive class of drugs that sharply reduce plasma LDL cholesterol.

Dr. Michael Ozner is a member of the Life Extension Scientific Advisory Board, a board certified cardiologist, and director of an annual symposium on preventing cardiovascular disease. This report concerns presentations made at his February 2017 symposium.
when HDL is loaded with triglycerides, the HDL can become proinflammatory and cause atherosclerosis.\textsuperscript{14} High levels of triglycerides on any of the lipoproteins cause inflammation.\textsuperscript{15} Elevated triglycerides are associated with cardiovascular disease even in patients who have been successfully treated with statins.\textsuperscript{12} When type II diabetics have high triglycerides, they show greater coronary artery calcification (atherosclerosis).\textsuperscript{16}

**Potential Benefit of HDL Cholesterol**

Sergio Fazio, MD, PhD (director of the Center for Preventive Cardiology at Oregon Health & Science University, Portland, Oregon) is concerned with the effects of HDL cholesterol on cardiovascular disease. Even among persons with low LDL cholesterol, those with the highest HDL cholesterol have less risk of cardiovascular disease than those with low HDL cholesterol.\textsuperscript{17} But while clinical trials have succeeded in raising HDL cholesterol in patients, this did not reduce cardiovascular disease risk.\textsuperscript{18,19} HDL cholesterol can become proinflammatory when LDL cholesterol is high.\textsuperscript{20} Another reason why raising HDL cholesterol was not effective may have been that there are different forms of HDL cholesterol, with some forms being more protective than others.\textsuperscript{21} HDL sub-classes appear to have different functions. For example, small HDL particles appear to have the capacity to remove cholesterol from atherosclerotic plaques.\textsuperscript{22,23} A newly discovered compound known as CSL112 is capable of making HDL cholesterol particles smaller, and thereby more efficient at removing cholesterol from atherosclerotic plaques.\textsuperscript{24} CSL112 has not shown any harmful effects in clinical trials.

**Conference Overview**

Michael Ozner, MD (medical director, Center for Prevention and Wellness, Baptist Health South Florida, Miami, Florida) as director of this symposium gave an overview of topics related to cardiovascular disease prevention. Dr. Ozner emphasizes the importance of a healthy lifestyle, noting that even in patients with high genetic risk for coronary artery disease, a healthy lifestyle can reduce that risk by half.\textsuperscript{2}

Dr. Ozner is a firm believer in the benefits of the diet eaten in the region of the Mediterranean sea (one of his books is titled *The Complete Mediterranean Diet*). He mentioned a study of over 100,000 health professionals which found that replacing 5\% of dietary saturated fat with either polyunsaturated fat, monounsaturated fat, or whole-grain carbohydrate reduced coronary heart disease risk by 25\%, 15\%, or 9\%, respectively.\textsuperscript{3} Aerobic exercise can reduce plasma triglycerides by up to 20\%.\textsuperscript{4}

Concerning blood lipids, Dr. Ozner is very concerned about apolipoprotein B (apoB), which is the primary protein portion of all cholesterol particles other than HDL cholesterol.

High apoB is a better predictor of cardiovascular disease than high levels of LDL cholesterol.\textsuperscript{5} High apoB indicates numerous small, dense LDL cholesterol particles, the form of LDL which is most likely to be oxidized and cross blood vessel walls to cause atherosclerosis.\textsuperscript{6} High apoB in young adults predicts coronary artery calcification in midlife.\textsuperscript{7}

Reduction of LDL cholesterol with statin drugs has been shown to reduce the incidence of heart attack and stroke.\textsuperscript{8,9} Using both a statin and anti-PCSK9 antibody is even more effective at lowering LDL cholesterol than statin alone.\textsuperscript{10,11}

**Triglycerides and Cardiovascular Disease**

Peter Libby, MD (cardiovascular specialist, Brigham and Women’s Hospital, Boston, Massachusetts) spoke about the increasing levels of plasma triglycerides in Americans. Roughly a quarter of American adults have excessively high levels of blood triglycerides.\textsuperscript{12} Triglyceride-laden lipoprotein is an even greater cause of coronary heart disease than LDL cholesterol.\textsuperscript{13}

Dr. Libby has noted that high HDL cholesterol tends to be associated with low plasma triglycerides, and vice versa.\textsuperscript{14} But
High Blood Pressure

William Cushman, MD (professor, Preventive Medicine, University of Tennessee, Memphis, Tennessee) is concerned with high blood pressure as a cause of cardiovascular disease. Nearly one third of American adults have **systolic blood pressure** (when the heart contracts) greater than 140 mmHg and **diastolic pressure** (when the heart relaxes) greater than 90 mmHg. This high level (>140 mmHg systolic) of blood pressure raises the risk of coronary artery disease 44%, raises the risk of stroke 57%, raises the risk of heart failure 88%, and raises the risk of kidney failure 95%. A clinical study investigated whether persons having a systolic pressure above 130 mmHg would benefit from therapy to reduce systolic pressure to less than 120 mmHg. Three years after systolic blood pressure was lowered, death rates dropped by about 25%.27

Approximately a quarter of persons with high blood pressure (systolic pressure above 140 mmHg) cannot reduce their blood pressure with three medications (resistant hypertension).28 Most often, people with resistant hypertension are obese or elderly. People with high blood pressure are more likely to have their blood pressure increased by salt consumption than people with normal blood pressure.29 Eating foods higher in potassium, such as fruits and vegetables (rather than cereals and meats) can lower blood pressure.30 The American Heart Association has estimated that increasing potassium consumption can decrease blood pressure and lengthen lifespan by several years.30

**Life Extension** has long advocated optimal blood pressure in most people to be 115 mmHg systolic and 75 mmHg diastolic. Newer studies corroborate the benefits of having lower normal blood pressure readings.

Stroke Risk

Ian del Conde Pozzi, MD (cardiologist, West Kendall Baptist Hospital, Miami, Florida) spoke of the risk of stroke. More than 60% of patients with type II diabetes die of cardiovascular disease. But glucose control does not affect their risk of stroke.31 High blood pressure is the major risk factor for stroke.

A meta-analysis of 16 trials involving more than 70,000 patients showed that blood pressure-reducing medications lowered the incidence of stroke by 22%.32 Statin drugs were also shown beneficial. Clinical trials have shown that every 39 mg/dL decrease in LDL cholesterol resulted in a greater than 21% reduction of stroke risk.33

Omega-3 Fatty Acids in Fish Oil

Carl Lavie, Jr., MD (cardiologist, Ochsner Medical Center, New Orleans, Louisiana) discussed how the **omega-3** fatty acids found in fish oil can reduce cardiovascular disease. Fish oil supplements have been shown to reduce inflammation and blood vessel constriction,34 while reducing irregular heartbeats (cardiac arrhythmias).35

Approximately a third of Americans have excessively high blood triglycerides.36 High blood triglycerides are a strong predictor of residual risk of cardiovascular disease in patients receiving maximal doses of statins.36 **Omega-3** fatty acids reduce blood triglycerides significantly. The minimal effective dose is more than 2,000 mg of EPA/DHA from fish oil per day.37 Eskimos show prolonged bleeding times with their dietary consumption of 40 grams of omega-3 fatty acids per day, but Dr. Lavie has noted that doses of up to 7 grams per day do not cause prolonged bleeding.38 Consuming fish oil is safer than eating fish because toxic mercury attaches to fish meat, but is distilled out of quality omega-3 oil concentrates.38 One study showed that 4,000 mg of omega-3 fatty acids from fish oil reduce triglycerides by 45% in patients with high triglycerides.39

Lipoprotein(a)

Paul Ziajka, MD, PhD (clinical assistant professor, Florida University School of Medicine, Orlando, Florida) spoke on the subject of lipoprotein(a) [Lp(a)], which is a highly atherosclerosis-causing particle attached to an LDL cholesterol particle. Patients with low LDL cholesterol nonetheless have a high cardiovascular disease risk if Lp(a) is high.40 Lp(a) has less resistance to oxidation than plain LDL cholesterol.41 Niacin has been used to lower Lp(a).42 Combining niacin with statin was effective in lowering Lp(a) while at the same time increasing HDL cholesterol.43
PCSK9 Action and Benefit

Peter Toth, MD, PhD (director, Preventive Cardiology, CGH Medical Center, Sterling, Illinois) discussed PCSK9 inhibition. Experiments with mice have confirmed that PCSK9 inhibition lowers LDL cholesterol.44 LDL cholesterol lowering with PCSK9 inhibition has also been shown in humans.45

PCSK9 has been shown to lower not only plasma LDL cholesterol but also triglycerides46 and Lp(a).47 A clinical trial demonstrated that adding PCSK9 inhibition to statin therapy results in additional reduction of LDL cholesterol as well as additional reduction of cardiovascular death and disease.48 PCSK9 inhibitors are much more expensive than statins, costing in excess of $1,000 per month.49

Coronary Artery Calcium

Khurram Nasir, MD (cardiologist, Baptist Health Medical Group, Miami Beach, Florida) is an advocate of testing for coronary artery calcium (CAC). This test uses high-speed radiological imaging to measure calcium in atherosclerotic plaques in the arteries of the heart. This helps determine the extent of coronary atherosclerosis.

Cardiovascular deaths and disease events are rare for persons who have no detectable CAC, mainly occurring in diabetics and former smokers.50 CAC is a more direct measurement of atherosclerosis than plasma LDL cholesterol or C-reactive protein, which are risk factors for atherosclerosis.51

More than one-quarter of American adults over age 40 take statin drugs.52 But Dr. Nasir has determined that people with no detectable CAC usually do not need to take a statin.53

Bariatric Surgery

Anthony Gonzalez, MD (chief of surgery, Baptist Hospital of Miami, Miami, Florida) discussed the benefits of gastric surgery for obese patients. Bariatric surgery reduces the size of the stomach, thereby reducing the amount of food a person can eat. Bariatric surgery substantially reduces cardiovascular death rates in obese patients54 and substantially reduces symptoms of type II diabetes.55

In 2010, gastric bypass was the most common form of bariatric surgery, but by 2013 sleeve gastrectomy had become the more common form.56 Sleeve gastrectomy is less technically difficult to perform, but gastric bypass produces better results. According to one study, gastric bypass reduced body weight 23%, reduced triglycerides 40%, and reduced insulin use by 35%. For sleeve gastrectomy, the reductions were 19%, 29%, and 34%, respectively.57 Earlier studies have shown similar results.58 In all cases, bariatric surgery produced far better results than could be obtained by intensive treatment with medications.57,58

Concluding Remarks

Cholesterol is not a toxic substance. On the contrary, cholesterol is an essential component of all cell membranes. Steroid hormones (testosterone, estrogen, etc.), cortisol, bile acids, and vitamin D are synthesized from cholesterol. Cholesterol is so essential for mental function that nearly one fourth of the body’s cholesterol is in the brain, despite the fact that the brain accounts for only about 2% of total body weight.59,60 Suicidal patients typically have lower plasma cholesterol than nonsuicidal patients.61

LDL cholesterol becomes toxic when oxidized. Thus, smokers and other persons with high levels of oxidized LDL in their bloodstream are the main beneficiaries of cholesterol-lowering therapies. Considerable oxidation of LDL cholesterol occurs once it is behind blood vessels.62 Diabetes and chronic inflammation from other causes makes blood vessel walls more permeable to LDL and increases oxidative stress, thereby making LDL cholesterol more susceptible to oxidation.63,64

LDL is beneficial when it is transported from the liver to body tissues, as opposed to being deposited into the endothelium. HDL is “good cholesterol” because it attaches to oxidized cholesterol in LDL for transport back to the liver to be detoxified.65 Statins have cardiovascular benefits apart from LDL cholesterol lowering, including reduced inflammation.66

One of the most common side effects associated with statins (statin intolerance), is muscle pain. Statin intolerance, real or imagined, is usually seen as subjective complaints rather than objective measurable quantities.57 Especially in the elderly, muscle problems can be due to aging rather than statins. There are, nonetheless, objective problems seen with statin therapy, including an increased incidence of diabetes.68

Statins reduce the body’s synthesis of coenzyme Q10 and vitamin D. Statin intolerance could result from coenzyme Q10 depletion,69 L-carnitine deficiency,70 or vitamin D deficiency,71 all of which can be corrected with supplementation. •


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Celery is related to parsley and fennel, a member of the *Umbelliferae* family of plants. Mankind has cultivated it as a vegetable for thousands of years.

Let’s consider a few of the numerous if often overlooked health benefits contained in this popular, fibrous vegetable.

**Fiber**

At about 1.6 grams per cup, celery is high in fiber, which makes it beneficial for helping to fight everything from diabetes, heart disease, and high cholesterol to colon cancer and constipation.¹

**Anti-inflammatory**

Celery contains beneficial phytonutrients such as the flavonols quercetin and kaempferol, flavones such as luteolin, and phenolic acids. These antioxidants are known for their anti-inflammatory properties.² A study has shown that celery helps inhibit the activity of two proteins linked to inflammation—nuclear factor-kappa B (NF-kB) and tumor necrosis factor alpha (TNF-alpha).³

**Minerals**

Celery is rich with a number of important minerals. These include iron, zinc, copper, magnesium, calcium, and selenium, but chiefly potassium, which helps reduce the risk of heart disease and support cellular function in muscles.¹

It is best to choose organic celery whenever possible as commercially grown celery has been exposed to a great deal of pesticides.⁴,⁵

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**References**

It’s not easy to get in five servings of vegetables a day—and even if you do, cooking can destroy many of the protective compounds found in broccoli, Brussels sprouts, cauliflower, and celery.

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In 2001, Humberto Fasano received a staggering diagnosis: he had severe cardiomyopathy and congestive heart failure (CHF).

With these conditions, the heart muscle becomes flabby and stretched out. As a result, its pumping ability is weakened, and not enough oxygenated blood is circulated to the body, causing symptoms like exhaustion and arrhythmia. The condition is considered degenerative and incurable, meaning that once someone is diagnosed with congestive heart failure, there is no way to restore their heart function back to its normal level.

Doctors measure CHF by tracking the size of the left ventricle and by measuring how much blood it expells with every contraction, a measurement known as the “ejection fraction.” In general, doctors consider an ejection fraction above 55% to be normal.

Fasano had an ejection fraction of just 14%. And at 10.5 centimeters, his left ventricle was the largest ever recorded at the University of Miami Health System.
Based on this grim diagnosis, Fasano needed to be on the heart transplant list. Doctors told him that 50% of CHF patients usually die within five years of being diagnosed.

But Fasano, who says he always maintains an optimistic and hopeful attitude, wasn’t buying it. Instead of giving in to his diagnosis, he decided he would fight back and do everything he could to survive. Today, more than 15 years later, Fasano is thriving—and he’s always happy to tell the story of how he managed to outlast a chronic, seemingly hopeless diagnosis with the help of first-rate cardiac care and Life Extension®.

“I was never in fear or depressed,” Fasano says. “ ‘Give up’ is not in my dictionary, period.”

The Road Back

Initially, Fasano experienced symptoms such as shortness of breath and fatigue while performing everyday activities such as climbing stairs. In the short term, to help relieve his symptoms and support his weak heart, his doctors recommended immediate placement of a left-sided pacemaker/defibrillator. This device regulated his heart rhythm and, if necessary, shocked it back into a normal rhythm if something went wrong. Two years later, the device was upgraded to a biventricular pacemaker/defibrillator, which provides more comprehensive support to keep a normal heart rhythm.

While the devices went to work and Fasano adapted to an aggressive program of prescription drugs to reduce his symptoms, he launched an all-out effort to find relief. In 2004, “by the grace of God,” he came across an Internet forum where people with congestive heart failure were singing the praises of an orthomolecular therapist in Holland named Corrij Kooij. According to her patients, Kooij had developed a special program of supplements that was able to increase their ejection fraction by up to 15%.

“I immediately wrote Corrij and asked if she could help me,” Fasano says. “She accepted and requested I fill out a questionnaire, in addition to sending her my last two blood lab reports. She performed this service at zero cost to me.”

After reviewing his case, Kooij recommended a program of nine highly-targeted nutrients and supplements. These supplements (see sidebar) were designed to make his heart stronger by increasing intracardiac energy and to help his heart function more efficiently. The list included stalwarts like coenzyme Q10, magnesium, potassium, R-lipoic acid, and vitamins C and E. Each of the recommendations was backed up by extensive research showing a positive effect on cardiac function.

Naturally, Fasano wanted to make sure he was getting the best supplements possible. At the time, he was already taking a few supplements from Life Extension, so he wrote Kooij back and mentioned that he was taking Life Extension products already and did she have a particular brand she recommended. In his letter, he remarked that he would go anywhere in the world to obtain the very best.

“If she said I needed a Japanese supplement, I was prepared to go to Japan to buy it. But she immediately wrote back and said, ‘Humberto, here in Holland my husband and I take Life Extension’, ” he recalls. “I found all nine products within Life Extension’s line-up.”

This recommendation would end up launching a long-standing relationship between Fasano and Life Extension—but first he had to make sure his health didn’t deteriorate.

The Transplant

In 2014, 13 years after his diagnosis, Fasano had already outlived all expectations, but he was still looking for every advantage possible. That year, he signed up for an experimental stem-cell study at the University of Miami. Unfortunately, the treatment didn’t have the effect he’d hoped for. Later that year, with his condition worsening, he had to pull himself from the program. That autumn, he had two serious emergencies, one in October and one in November—then three more in January 2015.
By this time, it had become obvious that Fasano would have to take the next step. He would need a heart transplant. He applied to the Mayo Clinic Transplant Program and was accepted. While he was waiting, he spent several months taking a class of drugs called inotropes, and in summer 2015, he received a left-ventricular assist device, or LVAD. This specialized device acts as a kind of mechanical heart. LVADs were originally designed as a “bridge to transplant,” for short-term use, but recent advances in technology have stretched the horizon of time people can survive with an LVAD device. This was excellent news for Fasano and gave him time while the search for a donor heart began.

In January 2015, Fasano and his wife moved to Jacksonville, Florida, where the Mayo Clinic transplant hospital was located, to wait for his donor heart. With his typical optimism, Fasano loved Jacksonville.

“I spent months within 15 minutes of the heart transplant center,” Fasano says. “And I’ll tell you, we had a great time. I didn’t have any dietary restrictions anymore, so I told my wife, ‘Let’s go find all the good restaurants!’ So we did, and there are some great restaurants in Jacksonville!”

But that doesn’t mean it was easy. While they waited, Fasano’s doctors continued to refine his medication program, and his symptoms posed a daily challenge. He was tired more often and dealt with the side effects of his medications. “I was limited physically,” he said. “I couldn’t run or go upstairs. I couldn’t do a lot of the things I used to do. But emotionally, I never had a problem.”

Finally, that autumn, Fasano got the news—a suitable donor heart had been found. On November 18, he received a new heart.

It was a huge step forward, and it began his journey back. Eighteen months after his transplant, Fasano felt much better and has been able to participate more fully in life. “I have been able to go back to most of my normal activities, including work, walking every day, enjoying my family, and helping others as much as I can,” he says. “I also participate in a foundation in Panama that raises funds for people who need a transplant.”

**Fasano’s Lasting Connection with Life Extension**

More than anything else, Fasano is deeply grateful for all the help he’s received. “I owe my new life to God and his team first, including my caregiver 24/7 for sixteen continuous months: my wife Maria, who never had one complaint and never got tired. I still cannot believe her strength and persistence. My brother Max was also 24/7 dedicated to taking care of me uninterrupted. I’m extremely thankful for my doctors, my nurses and the whole medical team at Mayo Clinic and University of Miami, as well as the prayers of my family and friends. I’m also grateful to Corrij, my angel, and to Life Extension for the supplements I took for more than 10 years to control my illness.”

In fact, Fasano was so impressed with his results that shortly after he started his supplement regimen, he reached out to Life Extension to set up an appointment with the international team. Soon after, he became a general distributor for the company in Panama—a position he continues to hold.

“When I started this journey, I knew very little about vitamins and supplements,” he says. “I was a civil engineer who worked in construction and project management. Distributing Life Extension products was something I started on the side, but now it’s grown, and I’m doing great.”

**Humberto Fasano’s Heart Failure Protocol**

After Humberto Fasano reached out to Corrij Kooij, she sent him a supplement protocol designed to provide extra energy to a stressed heart muscle. The list of supplements Kooij recommended includes:

- **MSM:** 1,000 mg, 3x daily
- **Super Ubiquinol CoQ10:** 100 mg, 2x daily with meals
- **Chromium polynicotinate:** 200 mcg, 2x twice daily with meals
- **Optimized Carnitine with GlycoCarn®:** 2 capsules twice daily, a total of 2,800 mg, half-hour before or two hours after meals
- **Magnesium:** 2x daily
- **R-Lipoic acid:** 150 mg, 2x daily
- **Potassium:** 750 mg, 1x daily
- **Vitamin C:** 1,000 mg, 3x daily
- **Vitamin E:** 400 IU, 1x daily

Now, after the transplant, Fasano has also added the following supplements to his regimen:

- **Super Bio-Curcumin**
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- Taurine

**Blood Pressure & Vascular Support**
- Advanced Olive Leaf Vascular Support with Celery Seed Extract
- Arterial Protect
- Blood Pressure Monitor Arm Cuff
- Dual Action Blood Pressure
- Endothelial Defense™ with Pomegranate Complete and CORDIART™
- Endothelial Defense™ with GliSODin®
- Natural BP Management
- NitroVasc with CORDIART™
- Pomegranate Complete
- Pomegranate Fruit Extract
- Triple Action Blood Pressure AM/PM
- VenoFlow™

**Bone Health**
- Bone Restore
- Bone Restore with Vitamin K2
- Bone Strength Formula with KoAct®
- Bone-Up™
- Calcium Citrate with Vitamin D
- Dr. Strum’s Intensive Bone Formula
- Strontium Caps

**Brain Health**
- Acetyl L-Carnitine
- Acetyl L-Carnitine Arginate
- Blast™
- Brain Shield® Gastrodin
- CocoaMind™
- Cognitex® Basics
- Cognitex™ with Brain Shield™
- Cognitex™ with Pregnenolone & Brain Shield™
- Cognizin® CDP-Choline Caps
- DMAE Bitartrate (dimethylaminoethanol)
- Dopa-Mind™
- Ginkgo Biloba Certified Extract™
- Huperzine A
- Lecithin Granules
- Memory Protect
- Migra-Eeze™
- Neuro-Mag® Magnesium L-Threonate
- Neuro-Mag® Magnesium L-Threonate with Calcium and Vitamin D3
- Optimized Ashwagandha Extract
- PS (Phosphatidylserine) Caps
- Vincopetine

**Cholesterol Management**
- Advanced Lipid Control
- Cho-Less™
- CHOL-Support™
- Red Yeast Rice
- Theaflavins Standardized Extract
- Vitamin B3 Niacin Capsules

**Digestion Support**
- Artichoke Leaf Extract
- Digest RC®
- Effervescent Vitamin C - Magnesium Crystals
- Enhanced Super Digestive Enzymes
- Enhanced Super Digestive Enzymes with Probiotics
- Esophagel™
- Esophagel Guardian

**Energy Management**
- Adrenal Energy Formula
- Asian Energy Boost
- D-Ribose Powder
- D-Ribose Tablets
- Forskolin
- Mitochondrial Basics with BioPQQ®
- Mitochondrial Energy Optimizer with BioPQQ®
- NAD+ Cell Regenerator™
- Optimized NAD+ Cell Regenerator™
- Rheoserve®
- PQQ Caps with BioPQQ®
- Rhodiola Extract
- Riboflavin® French Oak Wood Extract
- Triple Action Blood Pressure

**Eye Health**
- Astaxanthin with Phospholipids
- Brite Eyes III
- Certified European Bilberry Extract
- Eye Pressure Support with Mitogens®
- MacuGuard® Ocular Support
- MacuGuard® Ocular Support with Astaxanthin
- Tear Support with MaquiBright®

**Fish Oil & Omegas**
- OMEGA FOUNDATIONS® Mega EPA/DHA
- OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans
- OMEGA FOUNDATIONS® Super Omega-3 EPA/DHA with Sesame Lignans & Olive Extract
- OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin
- OMEGA FOUNDATIONS® Provan® Purified Omega-7
- OMEGA FOUNDATIONS® Vegetarian DHA
- Organic Golden Flax Seed

**Food**
- California Estate Extra Virgin Olive Oil
- Rich Rewards® Breakfast Blend
- Rich Rewards® Breakfast Blend Natural Mocha Flavor
- Rich Rewards® Breakfast Blend Natural Vanilla Flavor
- Rich Rewards® Breakfast Blend Whole Bean Coffee
- Rich Rewards® Decaf Roast
- Stivia Sweetener

**Glucose Management**
- CinSulin® with InSea2® and Crominex® 3+ Mega Benfotiamine
- Tru Sugar Shield®

**Heart Health**
- Aspirin (Enteric Coated)
- BioActive Forte® & vitamin B12 Caps
- Cardio Peak™ with Standardized Hawthorn and Arjuna Homocysteine Resist
- Optimized Carnitine with GlycoCarn®
- Super Ubiquinol CoQ10
- Super Ubiquinol CoQ10 with BioPQQ®
- Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™
- Super-Absorbable CoQ10 Ubiquinone with d-Limonene
- TMG Powder
- TMG Liquid Capsules

**Hormone Balance**
- DHEA (Dehydroepiandrosterone)
- Inner Power
- Pregnenolone
- Triple Action Cruciferous Vegetable Extract with Resveratrol
- Triple Action Cruciferous Vegetable Extract

**Immune Support**
- AHCC®
- Enhanced Zinc Lozenges
- Immune Modulator with Tinofend®
- Immune Protect with PARECTIN®
- Immune Senescence Protection Formula™
- Kinoko® Gold AHCC
- Kinoko® Platinum AHCC
- Kyolic® Garlic Formula 102
- Kyolic® Reserve
- Lactoferrin (apolactoferrin) Caps
- NK Cell Activator™
- Optimized Garlic
- Optimized Quercetin
- Peony Immune
- ProBoost Thymic Protein A
- Reishi Extract Mushroom Complex
- Standardized Cistanche Ten Mushroom Formula®
- Zinc Lozenges

**Inflammation Management**
- 5-LOX Inhibitor with AprèsFlex®
- Advanced Bio-Curcumin® with Ginger & Turmeric
- Black Cumin Seed Oil
- Black Cumin Seed Oil with Bio-Curcumin®
- Boswella
- Cytokine Suppress™ with EGCG Serrafflazyme
- Specially-Coated Bromelain
- Super Bio-Curcumin®
- Zylflamend® Whole Body

**Joint Support**
- Arthro-Immune Joint Support
- Arthromax® Advanced with UC-II® & AprèsFlex®
- Arthromax® with Theaflavins & AprèsFlex®
- Arthromax® Herbal Joint Formula
- Bio-Collagen with Patented UC-II® Fast-Acting Joint Formula
- Glucosamine-Chondroitin Capsules
- Krill Healthy Joint Formula
- MSM (Methylsulfonylmethane)

**Kidney & Bladder Support**
- Cran-Max® Cranberry Whole Fruit Concentrate
- Optimized Cran-Max® with Ellirose™
- Uri Acid Control
- Water-Soluble Pumpkin Seed Extract

**Liver Health & Detoxification**
- Anti-Alcohol with HepatoProtection Complex
- Calcium D-Glucarate
- Chlorella
- Chlorophyllin
- Calcium D-Glucarate
- OptiMum® InSea2® and Crominex® 3+
- Yeast Free
- Water-Soluble Pumpkin Seed Extract
- AppleWise Polyphenol Extract
- Berry Complete
- Blueberry Extract
- Blueberry Extract with Pomegranate
- Green Tea Extract
- Resveratrol Extract
- Pomegranate Extract
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<td>COGNITEX® W/BRAIN SHIELD® 90 softgels</td>
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<td>ADVANCED ANTI-GLYcation Peptide Serum • 1 oz</td>
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**SUBTOTAL OF COLUMN 3**

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<td>100 tablets</td>
</tr>
<tr>
<td>80148</td>
<td>DHEA COMPLETE • 60 veg. caps</td>
<td>48.00</td>
<td>36.00</td>
<td>32.40</td>
<td>72.00</td>
<td>60 caps</td>
</tr>
<tr>
<td>80035</td>
<td>DHEA • 25 mg, 100 caps</td>
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<td>12.00</td>
<td>11.00</td>
<td>24.00</td>
<td>100 caps</td>
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<tr>
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<td>DHEA • 15 mg, 100 caps</td>
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<td>10.50</td>
<td>9.00</td>
<td>21.00</td>
<td>100 caps</td>
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<tr>
<td>80082</td>
<td>DHEA • 50 mg, 60 caps</td>
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<tr>
<td>80169</td>
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<td>60 caps</td>
</tr>
<tr>
<td>80135</td>
<td>DIGEST RC® • 30 tablets</td>
<td>19.95</td>
<td>14.96</td>
<td>12.75</td>
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<td>30 tablets</td>
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<tr>
<td>80212</td>
<td>DIGESTIVE ENZYMES (Enhanced Super) • 60 veg. caps</td>
<td>22.00</td>
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<td>33.00</td>
<td>60 caps</td>
</tr>
<tr>
<td>80212</td>
<td>DIGESTIVE ENZYMES w/PROBIOTICS (Enhanced Super) • 60 veg. caps</td>
<td>28.00</td>
<td>21.00</td>
<td>18.00</td>
<td>42.00</td>
<td>60 caps</td>
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<tr>
<td>01671</td>
<td>D, L-PHENYLALANINE • 500 mg, 100 veg. caps</td>
<td>18.75</td>
<td>14.60</td>
<td>12.00</td>
<td>28.00</td>
<td>100 caps</td>
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<tr>
<td>01540</td>
<td>DMAE BITARTRATE • 150 mg, 200 veg. caps</td>
<td>18.00</td>
<td>13.50</td>
<td>11.25</td>
<td>27.00</td>
<td>200 caps</td>
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**SUBTOTAL OF COLUMN 4**

**RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

**SEPTEMBER 2017**
<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>PRODUCT</th>
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<tr>
<td>01570</td>
<td>DNA PROTECTION FORMULA • 60 veg. caps</td>
</tr>
<tr>
<td>01931</td>
<td>DOG MIX • 100 grams powder</td>
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<tr>
<td>02006</td>
<td>DOPA-MIND® • 60 veg. tabs</td>
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<tr>
<td>00321</td>
<td>DR. PROCTOR’S ADVANCED HAIR FORMULA • 2 oz</td>
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<tr>
<td>00320</td>
<td>DR. PROCTOR’S HAIR SHAMPOO • 8 oz</td>
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<tr>
<td>01997</td>
<td>ENDOTHELIAL DEFENSE™ w/POMEGRANATE COMPLETE AND CONDAT™ • 60 softgels</td>
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<tr>
<td>00997</td>
<td>ENDOTHELIAL DEFENSE™ w/GLISODIN® • 60 veg. caps</td>
</tr>
<tr>
<td>01837</td>
<td>EPA/DHA (Mega) • 120 softgels</td>
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<tr>
<td>02099</td>
<td>ESOPHACOOL™ • 120 chewable tablets</td>
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<tr>
<td>01737</td>
<td>ESOPHAGEAL GUARDIAN (Berry flavor) • 60 chewable tablets</td>
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<tr>
<td>01642</td>
<td>EUROPEAN LEG SOLUTION DIOSMIN 95 600 mg, 30 veg. tabs</td>
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<tr>
<td>01706</td>
<td>EXTRAORDINARY ENZYMES • 60 caps</td>
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<tr>
<td>02008</td>
<td>(CALIFORNIA ESTATE) EXTRA VIRGIN OLIVE OIL 600 ml (16.9 fl. oz.)</td>
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<tr>
<td>01514</td>
<td>EYE PRESSURE SUPPORT W/MIRTGENOL® • 30 veg. caps</td>
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<tr>
<td>00105</td>
<td>FACE MASTER® Platinum • Facial Toning System</td>
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<td>00965</td>
<td>FAST-ACTING JOINT FORMULA • 30 caps</td>
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<tr>
<td>01717</td>
<td>FAST-C® w/HYDROQUERCETIN • 120 veg. tabs</td>
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<td>01664</td>
<td>FEMMENESSENCE MACAPAUSE® • 120 veg. caps</td>
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<td>02007</td>
<td>FIBER-IMMUNE SUPPORT (Apple Cinnamon) • 235 grams</td>
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<td>02125</td>
<td>FLORASSIST® GI w/PHAGE TECHNOLOGY™ 30 liquid veg. caps</td>
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<td>01821</td>
<td>FLORASSIST® HEART HEALTH • 60 veg. caps</td>
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<tr>
<td>01214</td>
<td>FLORASSIST® IMMUNE HEALTH • 30 veg. caps</td>
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<tr>
<td>01220</td>
<td>FLORASSIST® ORAL HYGIENE • 30 lozenges</td>
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<tr>
<td>01825</td>
<td>FLORASSIST® BALANCE • 30 liquid veg. caps</td>
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<tr>
<td>02000</td>
<td>FLORASSIST® MOOD • 60 caps</td>
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<tr>
<td>01820</td>
<td>FLORASSIST® THROAT HEALTH • 30 lozenges</td>
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<td>01913</td>
<td>FOLATE HIGH POTENCY (Optimized) 5,000 mcg, 30 veg. tablets</td>
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<td>01839</td>
<td>FOLATE (Optimized) 1,000 mcg, 100 veg. tablets</td>
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<td>01842</td>
<td>FOLATE + VITAMIN B12 (BioActive) • 90 veg. caps</td>
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<td>01545</td>
<td>FORSKOLIN • 10 mg, 60 veg. caps</td>
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<tr>
<td>01513</td>
<td>FUCOIDAN W/MARITECH® 926 (Optimized) • 60 veg. caps</td>
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<td>02070</td>
<td>GAMMA E MIXED TOCOPHEROL/TOCOTRIENOLS • 60 softgels</td>
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<td>02075</td>
<td>GAMMA E MIXED TOCOPHEROL w/ENHANCED SESAME LIGNANS • 60 softgels</td>
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<td>01394</td>
<td>GARLIC (Optimized) • 200 veg. caps</td>
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<td>02100</td>
<td>GASTRO-EASE™ • 60 veg. caps</td>
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<tr>
<td>01122</td>
<td>GINGER FORCE™ • 60 liquid caps</td>
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<tr>
<td>01658</td>
<td>GINKGO BILOBA CERTIFIED EXTRACT™ 120 mg, 365 veg. caps</td>
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<tr>
<td>00756</td>
<td>GLA WITH SESAME LIGNANS (Mega) • 60 softgels</td>
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<td>00345</td>
<td>(L-) GLUTAMINE CAPSULES • 500 mg, 100 veg. caps</td>
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<tr>
<td>00141</td>
<td>(L-) GLUTAMINE POWDER • 100 grams</td>
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<tr>
<td>00522</td>
<td>GLUCOSAMINE/CHONDROITIN CAPSULES • 100 caps</td>
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**SUBTOTAL OF COLUMN 5**
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<th>ITEM No.</th>
<th>PRODUCT</th>
<th>YOUR PRICE</th>
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<td>01511</td>
<td>NATURAL SLEEP® W/O MELATONIN</td>
<td>20.00 15.00</td>
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<td>01445</td>
<td>NATURAL SLEEP® MELATONIN</td>
<td>18.00 13.50</td>
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<tr>
<td>00987</td>
<td>NATURAL STRESS RELIEF®</td>
<td>28.00 21.00</td>
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<tr>
<td>01603</td>
<td>NEURO-MAG® MAGNESIUM L-THREONATE</td>
<td>40.00 30.00</td>
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<tr>
<td>01602</td>
<td>NEURO-MAG® MAGNESIUM L-THREONATE w/CALCIUM &amp; VITAMIN D3</td>
<td>40.00 30.00</td>
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<tr>
<td>01990</td>
<td>NITROVASC® w/CORDIART</td>
<td>18.00 15.00</td>
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<tr>
<td>01903</td>
<td>NK CELL ACTIVATOR®</td>
<td>45.00 33.75</td>
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<td>00373</td>
<td>NO FLUSH NIACIN</td>
<td>19.00 14.25</td>
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<td>01824</td>
<td>OLIVE LEAF VASCULAR SUPPORT</td>
<td>36.00 27.00</td>
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<td>01988</td>
<td>OMEGA-3 PLUS EPA/DHA w/SESAME LIGNANS, OLIVE EXTRACT, KRILL &amp; ASTAXANTHIN</td>
<td>45.00 33.75</td>
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<td>01983</td>
<td>OMEGA-3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE EXTRACT (Super)</td>
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<td>OMEGA-3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE EXTRACT</td>
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<td>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE EXTRACT (Super)</td>
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<td>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE EXTRACT (Super)</td>
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<td>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE EXTRACT (Super)</td>
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<td>01811</td>
<td>PEFONY IMMUNE</td>
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<td>00673</td>
<td>PGX® PLUS MULBERRY (WellBet®)</td>
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<td>01953</td>
<td>POMEGRANATE COMPLETE</td>
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<td>00956</td>
<td>POMEGRANATE FRUIT EXTRACT</td>
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<td>POMI-F®</td>
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<td>00577</td>
<td>POTASSIUM IODIDE</td>
<td>6.95 5.21</td>
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<td>01500</td>
<td>PQO CAPS w/BIOPOO®</td>
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<tr>
<td>01847</td>
<td>PQO CAPS w/BIOPOO®</td>
<td>40.00 30.00</td>
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<tr>
<td>00302</td>
<td>PREGNENOLONE</td>
<td>26.00 19.50</td>
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<td>00700</td>
<td>PREGNENOLONE</td>
<td>30.00 22.50</td>
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<td>01928</td>
<td>PRELOX® NATURAL SEX FOR MEN®</td>
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<td>00525</td>
<td>PROBOOST™ THYMIC PROTEIN A™</td>
<td>66.00 49.95</td>
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<td>01441</td>
<td>PROGESTA-CARE®</td>
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<td>01909</td>
<td>PROSTATE FORMULA (Ultra Natural)</td>
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<td>01444</td>
<td>PROSTATE FORMULA (Triple strength)</td>
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**SUBTOTAL OF COLUMN 8**
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<th>ITEM No.</th>
<th>PRODUCT</th>
<th>Retail Each</th>
<th>1 Unit Each</th>
<th>4 Unit Each</th>
<th>10 Unit Each</th>
<th>QTY</th>
<th>Total</th>
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<tbody>
<tr>
<td>01742</td>
<td>PROTEIN-ISOLATE (Whey) Vanilla • 403 grams</td>
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<td>01743</td>
<td>PROTEIN-ISOLATE (Whey) Chocolate • 437 grams</td>
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<tr>
<td>01770</td>
<td>PROTEIN CONCENTRATE (New Zealand Whey) Vanilla 500 grams</td>
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<tr>
<td>01771</td>
<td>PROTEIN CONCENTRATE (New Zealand Whey) Chocolate 640 grams</td>
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<td>01812</td>
<td>PROVINAL* PURIFIED OMEGA-7 • 30 softgels</td>
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<td>01676</td>
<td>PS CAPS (Phosphatidylserine) • 100 mg, 100 veg. caps</td>
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<td>PTEROPUR® Pterostilbene • 50 mg, 60 veg. caps</td>
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<td>01209</td>
<td>PUMPKIN SEED EXTRACT (Water-soluble) • 60 veg. caps</td>
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<td>PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT 100 mg, 60 veg. caps</td>
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<td>PYRIDOXAL 5’-PHOSPHATE • 100 mg, 60 veg. caps</td>
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<tr>
<td>01309</td>
<td>QUERCETIN (Optimized) • 250 mg, 60 veg. caps</td>
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<td>RED YEAST RICE (Bluebonnet) • 600 mg, 60 veg. caps</td>
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<td>00889</td>
<td>REGIMINT • 60 enteric-coated caps</td>
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<td>01708</td>
<td>REISHI EXTRACT MUSHROOM COMPLEX • 60 veg. caps</td>
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<td>01410</td>
<td>RESVERATROL W/pterostilbene • 100 mg, 60 veg. caps</td>
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<td>RESVERATROL W/nicotinamide riboside (Optimized) • 30 veg. caps</td>
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<td>RESVERATROL (Optimized) • 60 veg. caps</td>
<td>46.00</td>
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<td>RHODIOLA EXTRACT • 250 mg, 60 veg. caps</td>
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<td>01900</td>
<td>RIBOGEN® FRENCH OAK WOOD EXTRACT 200 mg, 30 veg. caps</td>
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<tr>
<td>00972</td>
<td>(D) RIBOSE POWDER (Optimized) • 150 grams</td>
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<td>(D) RIBOSE TABLETS • 100 veg. tabs</td>
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<td>RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Mocha • 12 oz. bag</td>
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<td>RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Vanilla • 12 oz. bag</td>
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<td>RICH REWARDS® BREAKFAST BLEND WHOLE BEAN COFFEE 12 oz. bag</td>
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<td>RICH REWARDS® DECAFEDENATED ROAST GROUND COFFEE 12 oz. bag</td>
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<td>00070</td>
<td>RNA CAPSULES • 500 mg, 100 caps</td>
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**SUBTOTAL OF COLUMN 9**

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<th>ITEM No.</th>
<th>PRODUCT</th>
<th>Retail Each</th>
<th>1 Unit Each</th>
<th>4 Unit Each</th>
<th>10 Unit Each</th>
<th>QTY</th>
<th>Total</th>
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<tr>
<td>02110</td>
<td>SHADE FACTOR® SUNSCREEN LOTION • 4 fl. oz</td>
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**SUBTOTAL OF COLUMN 10**

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
**RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

| ITEM No. | PRODUCT | Retail Each $ | 1 Unit Each | 4 Unit Each | 10 Unit Each | QTY Total
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<tr>
<td>01921</td>
<td>URIC ACID CONTROL • 60 veg. caps</td>
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**SUBTOTAL OF COLUMN 11**

| ITEM No. | PRODUCT | Retail Each $ | 1 Unit Each | 4 Unit Each | 10 Unit Each | QTY Total
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<td>ZYFLAMEND+ WHOLE BODY • 120 liquid veg. caps</td>
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**SUBTOTAL OF COLUMN 12**

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** Due to license restrictions, this product is not for sale to customers outside of the USA.
*** Due to license restrictions, this product is not for sale to Canada.
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SEPTEMBER 2017
## ORDER SUBTOTALS

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<td>C.O.D.s (ADD $7 FOR C.O.D. ORDERS)</td>
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<td>UPS OVERNIGHT add $16, UPS 2nd DAY AIR add $7; For Puerto Rico, US Virgin Islands, add $7; Canada UPS EXPRESS Flat rate $17.50, UK Flat rate $25 USD; All other international air will be added.</td>
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### GRAND TOTAL (MUST BE IN U.S. DOLLARS)

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**PLEASE MAIL TO:** Life Extension  
P.O. Box 407198 • Ft. Lauderdale, Florida 33340-7198  
Or Call Toll Free 1-800-544-4440 • Fax: 866-728-1050

---

**BILL TO ADDRESS**

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**SHIP TO ADDRESS**

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Glaucoma is a common cause of blindness. A human study demonstrates eye pressure reduced by 24% using two plant extracts.

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Swiss researchers have identified a molecule produced in the body from pomegranates that protects mitochondrial function.