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<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td>Vitamin K1</td>
<td>1,500 mcg</td>
</tr>
<tr>
<td>Vitamin K2 (MK-4)</td>
<td>1,000 mcg</td>
</tr>
<tr>
<td>Vitamin K2 (all-trans MK-7)</td>
<td>100 mcg</td>
</tr>
</tbody>
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Super K with Advanced K2 Complex
Item #02034 • 90 softgels

<table>
<thead>
<tr>
<th></th>
<th>Retail Price</th>
<th>Your Price</th>
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<tbody>
<tr>
<td>1 bottle</td>
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</tr>
<tr>
<td>4 bottles</td>
<td>$20.25 each</td>
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</tbody>
</table>

Each bottle lasts for three months.

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These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
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In 1968, Lyndon Johnson announced he would not accept the nomination of his party for another term as president of the United States.

Lyndon Johnson (LBJ) suffered severe coronary artery occlusion. Conventional medicine had no safe treatment. LBJ knew that men in his family did not live much beyond 60 years.

In 1955, LBJ had the first of several heart attacks. Suffering chronic angina pain, LBJ declined to run for re-election at age 59 and died at 64.

Move forward a few decades and vast improvements occurred in prevention and treatment of heart disease. So much so that Bill Clinton, George W. Bush, and Dick Cheney were spared the fate of Lyndon Johnson.

In the years spanning 1980 to 2014, there was an astounding 50% decline in cardiovascular-related deaths.¹ The reasons have a lot to do with what readers of this magazine practice every day to reduce their risk of atherosclerosis.

There have also been massive enhancements in coronary artery stenting and surgical bypass procedures. None of these interventions are perfect, but they’re better than enduring chronic chest pain, disability, and fatal heart attack, as LBJ and others suffered during his era.

But did Lyndon Johnson really have no effective treatment option in 1968? And are other former presidents following optimal coronary prevention strategies today?

Even a cursory review uncovers startling lapses by presidential cardiologists in initiating steps to prevent and reverse coronary artery blockage. This fate often befalls high-end individuals who get the “best” of conventional care, which inherently overlooks novel approaches to better treatments.

This tragedy persists today because many people are not utilizing affordable methods to identify their vascular risk factors in time.
Pioneer of Modern Cardiology

John Gofman, M.D., Ph.D., was a physicist turned medical doctor whose early work on radioactive isotopes resulted in his being recruited to work on The Manhattan Project to develop the first atomic bomb.

Dr. Gofman’s expertise on the biological effects of radiation caused him to take a controversial position. He documented how diagnostic X-rays are a cause of cancer and artery disease, something most in the medical establishment still refuse to accept.8-13

In 1947, Dr. Gofman began research that led him to conclude that cholesterol is a cause of atherosclerosis.6,7

Dr. Gofman and his colleagues were the first to show that specific fractions of cholesterol such as LDL (low-density lipoprotein) contribute to clogged arteries.14

In 1951, Dr. Gofman was involved in the publication of possibly the first book advocating low-fat/low-cholesterol diets to prevent heart disease.15

Role of Nathan Pritikin

Nathan Pritikin was a millionaire inventor in areas as diverse as engineering, photography, and aeronautics.

President Dwight Eisenhower suffered his first heart attack in 1955. He had an ischemic stroke in 1957.

By the time of his death in 1969, Eisenhower suffered seven heart attacks, along with multiple diseases related to the unhealthy lifestyle of his era.2

Lyndon Johnson was 46 years old when his first heart attack struck in 1955. LBJ suffered angina pain until he succumbed to heart disease in 1973.3

In 1972, former president Harry Truman died from coronary artery disease, as did almost one million other Americans that year.

Back in those days, recovery from a heart attack was a slow and arduous process. Doctors recommended bed rest, no physical activity, and little in the way of dietary changes.

Was this vascular disease carnage necessary? A review of the published literature dating back to the 1940s reveals millions could have been spared...if only their doctors had bothered paying attention.5,7

Bill Clinton’s Struggle With Coronary Artery Blockages

Bill Clinton underwent procedures in 2004 and 2010 to reopen blocked coronary arteries. Surgical complication resulted in his being rehospitalized.

2004 - Coronary Bypass, Age 58
2010 - Coronary Stents, Age 63

(These procedures were not safely available to LBJ in the 1955-1973 era.)
In 1987, the Journal of the American Medical Association announced a study that showed regression of atherosclerosis in the coronary arteries of humans who reduced their blood cholesterol by a similar degree as was accomplished using the Pritikin protocol.22 Had Dwight Eisenhower or Lyndon Johnson paid attention to published scientific studies linking poor diets to coronary artery disease, they could have been spared years of suffering and premature death.

Improved Heart Attack Prevention

We know far more now than what John Gofman and Nathan Pritikin uncovered more than 60 years ago. Back in those early days, there were no well-known effective methods to lower vascular risk factors (such as elevated LDL) other than strict low-calorie/ultra low-fat diets. Few people of that era were willing to give up their bacon, butter, steak, and eggs, let alone start eating healthy vegetables and fruit.

Today we know that not all fats are dangerous. For instance, solid data supports the value of extra-virgin olive oil23-25 and omega-3 fatty acids in lowering cardiovascular risk and risk of dying from cardiovascular disease.26-29

In lieu of the ultra low-fat diet espoused by Nathan Pritikin, the preponderance of data indicates that following a Mediterranean-style diet is an effective and practical way to reduce one's cardiovascular risks.30,31

Since our inception, Life Extension® has advised healthy people to keep their LDL (low-density lipoprotein) below 100 mg/dL. Those with pre-existing coronary artery disease should strive to push LDL below 70 mg/dL.

The medical community now concurs with our LDL guidelines.

George Bush Diagnosed and Treated Before He Suffered a Heart Attack

George W. Bush underwent aggressive diagnostics before his heart was damaged by a heart attack. According to a news report, “He was more than 95 percent occluded. With a blockage like that in a main artery you’re supposed to die…”

2013 - Coronary Stent, Age 67

http://www.foxnews.com/health/2013/10/15/george-w-bush-artery-was-5-percent-blocked-source-says.html
I’m pleased that we can now identify earlier stages of atherosclerosis using a blood test that measures apolipoprotein B.

I’m even more excited that we are able to add apolipoprotein B to our popular Male and Female Panels at no extra charge!

**Danger of Elevated Apolipoprotein B**

Apolipoprotein B is found on all non-HDL cholesterol particles, such as LDL and VLDL.

The higher the ApoB number the more dangerous the situation. Higher ApoB generally equates to a higher amount of glycated and oxidized LDL particles, which are initiators of dangerous arterial plaque.32

Having a higher ApoB (apolipoprotein B) level can be a stronger heart attack predictor than LDL cholesterol.33,34

Until recently, testing one’s blood for apolipoprotein B (ApoB) was expensive. Even today, commercial labs charge $150 for this test (ApoB) of vascular risk.

**Check Your Apolipoprotein B at No Added Cost!**

Those with high apolipoprotein B blood levels are at greater risk for coronary artery disease.35

If an apolipoprotein B blood test comes back high, steps can be initiated to correct this.

The incredible news is that apolipoprotein B has been added to the Male and Female Blood Panels many of our supporters have done each year.

The addition of this vascular risk marker makes these comprehensive blood panels a greater value...at no additional cost!

**How Blood Tests Are Saving Lives**

Every day, we at Life Extension receive calls from people asking what they should do to reduce their degenerative disease risks. My response is that we have no idea until we review their blood test results.

In many cases, blood test panels that new people submit consist of little more than measures of glucose, lipids and liver/kidney function. Omitted almost always are tests for C-reactive protein, DHEA, homocysteine and other controllable risk factors.

To resolve this lack of data, we combined the most powerful indicators of heart attack/stroke risk into comprehensive Male and Female Blood Panels.

The retail price of having all these tests done can approach $900. We’ve been able to use our high volume to drive the cost of these popular panels down to $199 during our annual Lab Test Super Sale.

I’m proud of how we’ve added more tests to these panels over the years, such as 25-hydroxyvitamin D and hemoglobin A1c...without raising the price!

We sometimes find our supporters are taking too much vitamin D or DHEA and are able to suggest they reduce their dose. In other cases, we identify markers that predispose one to cancer, dementia, atherosclerosis, or kidney failure.

Once uncovered via comprehensive blood testing, most people are able to move these markers into safer ranges.

**Alive Because of Biomedical Advances**

Dick Cheney survived multiple heart attacks and eventual heart failure. He is alive only because of technological advances.

**1988 - Coronary Bypass, Age 47**

**2000 - Coronary Stents, Age 59**

**2010 - Ventricular Assist, Age 69**

**2012 - Heart Transplant, Age 71**
As We See It

In any case, gaining knowledge that a blood marker is out of balance enables corrective actions to be taken before serious illnesses manifest.

This year's blood test sale expires on June 4th, 2018.

To order the new Male or Female Blood Panels (that now include ApoB) at the bargain price of $199, call 1-800-208-3444 (24 hours) or log on to: LifeExtension.com/labservices

Summary

I hope the historical data conveyed in this editorial enable readers to understand that atherosclerosis is a normal part of aging.

One reason heart attacks did not kill more people in years 1900-1944 is that average life expectancy during this period was only 55 years.

Now that people are living longer, they need to be vigilant in protecting against arterial occlusion, and it starts with comprehensive blood tests.

For longer life,

William Falloon, Co-Founder
Life Extension Buyers Club

References

Harsh Penalty for Willful Medical Ignorance

Turn back the clock just 54 years, and history reveals how the FDA and medical establishment ridiculed the notion that poor diets were a cause of artery disease.

This medical ignorance resulted in the most famous political leaders of their day keeling over from heart attacks before the public’s eyes.

For example, Dwight Eisenhower smoked four packs of cigarettes a day until he quit in 1949. Combined with his high saturated-fat intake, he was at great cardiac risk. Here is what President Eisenhower ate the day of his first heart attack:36

- Breakfast: sausage, bacon, mush, hotcakes
- Lunch: hamburger with raw onion
- Dinner: roast lamb

Heart attack and/or stroke claimed the lives of most of the presidents in the past century including Theodore Roosevelt, William Taft, Woodrow Wilson, Calvin Coolidge, Franklin Roosevelt, and Richard Nixon (hemorrhagic stroke).

Unlike commercial blood labs that test only a few risk factors, Life Extension®’s Male and Female Blood Test Panels measure a wide range of blood markers that predispose people to age-related diseases. Just look at the huge number of parameters included in the Male and Female Blood Test Panels:

### MALE PANEL

**CARDIAC MARKERS**
- Apolipoprotein B (ApoB)
- Homocysteine
- C-Reactive Protein (high sensitivity)

**LIPID PROFILE**
- Total Cholesterol
- LDL (low-density lipoprotein)
- HDL (high-density lipoprotein)
- Triglycerides

**METABOLIC PROFILE**
- Glucose
- Hemoglobin A1c
- Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
- Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
- Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
- Blood proteins: albumin, globulin, total protein, albumin/globulin ratio

**COMPLETE BLOOD COUNT (CBC)**
- Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
- White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
- Platelet count

**CANCER MARKER**
- PSA (Prostate Specific Antigen)

**HORMONES**
- Free and Total Testosterone
- DHEA-S
- Estradiol (an estrogen)
- TSH (thyroid function)
- Vitamin D (25-hydroxyvitamin D)

### FEMALE PANEL

**CARDIAC MARKERS**
- Apolipoprotein B (ApoB)
- Homocysteine
- C-Reactive Protein (high sensitivity)

**LIPID PROFILE**
- Total Cholesterol
- LDL (low-density lipoprotein)
- HDL (high-density lipoprotein)
- Triglycerides

**METABOLIC PROFILE**
- Glucose
- Hemoglobin A1c
- Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
- Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
- Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
- Blood proteins: albumin, globulin, total protein, albumin/globulin ratio

**COMPLETE BLOOD COUNT (CBC)**
- Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
- White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
- Platelet count

**HORMONES**
- Progesterone
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Reference

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In The News

Cleveland Clinic Journal Supports Non-Fasting Blood (Lipid) Testing

An article in the prestigious Cleveland Clinic Journal of Medicine has taken a stand in support of performing lipid blood tests without fasting.*

This stance echoes the opinion of Life Extension® as expressed in the As We See It column of our May 2017 issue.

The authors, Dr. Zareen Farukhi and Dr. Samia Mora, say that while fasting was for many years the standard practice, nonfasting testing has been gaining acceptance in medical institutions around the world.

They point out that past concerns—such as that an increase in triglyceride concentrations after consuming a fatty meal could reduce the validity of the results—haven’t been borne out by research.

As well, the authors write that recent studies “suggest that postprandial effects do not diminish and may even strengthen the risk associations of lipids with cardiovascular disease, in particular for triglycerides.”

Moreover, in some patients, such as those with diabetes or metabolic syndrome, fasting could mask abnormalities in high-triglyceride metabolism that can only be detected with a non-fasting test.

The doctors conclude: “For most patients, non-fasting lipid testing is appropriate. It is evidence-based, safe, valid, and convenient.”

Editor’s Note: The study authors believe that more widespread adoption of nonfasting lipid blood tests by U.S. healthcare providers would improve quality of care and patient and clinician satisfaction.

Metformin Reduces Cancer Risk in Type II Diabetics

Recent research has demonstrated an association between metformin use and a reduced risk of cancer in patients with type II diabetes.*

Existing medical research indicates that type II diabetics are at a higher risk of cancer due to insulin resistance and higher blood levels of both insulin and insulin-like growth factors. In order to investigate the relationship between the diabetes medication metformin and cancer incidence, researchers conducted a large-scale, nationwide, prospective, multicenter cohort study in Korea.

In an average follow-up period of 5.8 years, 164 of the 1,918 study subjects developed cancer. In that time, subjects using metformin were almost half as likely to develop cancer as those who did not take the medication.

The reduced risk held true even after controlling for other factors, such as other diabetic medications, various demographic characteristics, and metabolic parameters.

Editor’s Note: An analysis of subgroups in the study also showed reduced cancer risk for nonsmokers, non-obese patients, males, and patients with good glycemic control.

First Episode Psychosis and Vitamin Deficiencies

Findings from a meta-analysis reveal significantly lower levels of folate and vitamin D among individuals experiencing their first psychotic episode in comparison with control subjects.*

Joseph Firth, Ph.D., of NICM Health Research Institute at Western Sydney University in Australia, and his colleagues analyzed 28 studies that examined blood levels of six vitamins and 10 minerals in 1,221 subjects who presented with first episode psychosis and 1,391 control subjects. They found significantly lower levels of the B vitamin folate and vitamin D in those with first episode psychosis compared to the controls.

Rising levels of both vitamins were associated with decreases in symptoms. The authors remarked that there was also limited evidence for an association between first episode psychosis and reductions in vitamin C.

Editor’s Note: “Our research has found vitamin D and folate deficiencies, previously observed in long-term schizophrenia, exist right from illness onset, and are associated with worse symptoms among young people with psychosis,” Dr. Firth observed. “Since both of these nutrients are vital for physical and psychological wellbeing, this finding emphasizes the importance of promoting a healthy diet for young people with psychosis, and potentially suggests adding targeted nutritional supplementation to standard treatment could improve recovery, although this theory has yet to be tested.”

* Schizophr Bull. 2017 Nov 30.
Low Vitamin D Levels Predict Erectile Dysfunction in Diabetics

An article published in The Aging Male reveals an association between decreased serum vitamin D levels and a greater risk of erectile dysfunction (ED) in diabetics.*

The study included 98 diabetic men. International Index of Erectile Function (IIEF-5) questionnaire scores determined the presence and severity of ED, with higher scores indicative of no ED.

Among the 77 participants with the condition, 45 had moderate ED and 32 had severe ED. Blood samples were analyzed for 25-hydroxyvitamin D levels, hormones and other factors.

A moderate correlation was observed between increased vitamin D levels and higher IIEF scores, particularly among those between 45 and 65 years of age. Men whose IIEF-5 scores were indicative of severe ED had vitamin D blood levels that averaged only 10.51 ng/mL, which was significantly lower than the average levels of participants with no or moderate ED. (Optimal blood levels of 25-hydroxyvitamin D are considered 50-80 ng/mL.)

Editor’s Note: “There is a significant relationship between 25(OH)D deficiency and ED in male patients with type II diabetes mellitus,” the authors write. “This relationship is considered to be mediated by increased nitric oxide production by 25(OH)D in endothelial cells through various pathways, inhibition of apoptosis and prevention of endothelial dysfunction by preventing against oxidative stress.”

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The Search for Natural Products to Support Sexual Health

It’s hard to believe that 20 years have passed since the FDA approved Viagra® to treat erectile dysfunction.

Starting in 1998, this drug class generated a flurry of media headlines, endless TV ads, and lively public discourse about what was a socially repressed topic, i.e., loss of sexual function with age.

Viagra®, Cialis®, and Levitra® work rapidly to enhance penile blood flow through inhibition of an enzyme called phosphodiesterase type 5 (PDE5). This prescription drug class is known as PDE5 inhibitors.

Reduced penile blood flow, though an important aspect of erectile dysfunction, does not address other factors crucial for sexual satisfaction including interest and desire.

In addition, cost and safety are important considerations with prescription drugs of this class.

We at Life Extension® found that many “natural” formulas promising immediate, dramatic increases in sexual performance were spiked with either the same drug(s) as Viagra® and Cialis® or very close structural analogs to prescription drugs. This immediately disqualified these products from our consideration.

That’s why we were excited when we recently learned about a ginger-like root that has a long tradition of use in South Asia.1-3 Published studies show that in contrast to the rapid effects of PDE5 inhibitors on local penile blood flow, taking this natural ingredient over time can result in improvements in erectile function, response time, and intercourse satisfaction in a modest, sustainable, and most importantly, safe fashion.1,4

Preclinical studies reveal how this plant extract gently supports local blood flow while enhancing brain responses to sexual stimuli.3,5-9 In other words, this ginger-like root works on both the brain and the body to enhance the sexual experience. Human studies demonstrate noticeable results after about 30 days.1,4

Due to controversies surrounding sex enhancement products, Life Extension also conducted a small study of the effects of this ginger-like extract in men with age-associated decreases in sexual satisfaction. We wanted to further assess safety and efficacy for this interesting ingredient.

In contrast to rapid vascular effects and potential safety risks associated with potent, prescription erectile-dysfunction drugs, this article reports on data supporting sustainable, modest improvements in age-related changes in sexual satisfaction with use of a ginger-like root extract over time.
It’s a mistake to limit discussion of male sexual dysfunction to localized erectile dysfunction. Male sexuality is about more than the mechanical aspects of erection. Sexual health includes interest, response, desire, and satisfaction.

Regarding these multiple factors, a ginger-like root extract called Kaempferia parviflora has attracted considerable interest. Unlike other approaches to erectile dysfunction that focus exclusively upon rapid effects related to localized penile blood flow, this botanical compound appears to stimulate and support sensory and physical responses to erotic stimulation for increased satisfaction.

Human Studies

Two human clinical trials in aging men show that this ginger-like extract improved parameters that indicate enhancement in the overall male sexual experience.\textsuperscript{1,4}

In the first study, 45 men (average age 65 years) were divided into three groups that received either a placebo, a 25 mg dose of Kaempferia extract, or 90 mg of Kaempferia extract daily for eight weeks.\textsuperscript{1}

Men taking the 90 mg/day dose had a quicker erectile response time to visual erotic stimuli compared to placebo. The time from stimulus to full erection was cut in half (from about 10 to about 5 minutes).\textsuperscript{1}

Men in the 25 mg group also had improvements in response time, but these did not achieve statistical significance, indicating that the dose was not high enough.

The supplemented men also experienced improvements in penile circumference (penile girth) over time. The circumference of those taking 90 mg/day rose by as much as 1-1.5 centimeters (about half an inch) in one month—an increase that was largely sustained at two months.

Penile length also increased about a centimeter in both the flaccid and erect state, after one month, compared with placebo.\textsuperscript{1}

Longtime supporters of Life Extension know the crucial importance of healthy testosterone levels in supporting sexual health, as well as a variety of other aspects of overall health, in aging men. This study revealed no significant changes in testosterone or other sex hormones between the placebo and treated groups, during or after the study.\textsuperscript{1}

This finding suggests that Kaempferia extract works by mechanisms beyond androgens (male sex hormones).

The researchers speculated that these findings may reflect involvement of the blood-vessel dilator nitric oxide.\textsuperscript{1}

Endothelial nitric oxide enables arteries to expand and contract with youthful elasticity. With aging, nitric oxide levels decline, setting the stage not only for erectile problems but greater risk of cardiovascular disorders.

Stated simply, an inadequate release of nitric oxide results in constricted blood vessels that obstruct healthy blood flow.\textsuperscript{10}
Increased Sexual Satisfaction

In a second study completed in 2017, researchers at Life Extension conducted a small open-label (no placebo) clinical study in 13 healthy older men (50-70 years old) who experienced mild dissatisfaction with their sexual health, likely reflecting mild-to-moderate erectile dysfunction associated with aging.4

Men in this study took Kaempferia extract standardized to 5% of the active compound, 5,7-dimethoxyflavone (5,7-DMF), at a slightly higher dose of 100 mg.4 The active 5,7-DMF compound has been shown in lab studies to be important for Kaempferia’s mechanisms of action.6

Outcome measures were based on the men’s reported experiences while taking the supplement, as opposed to physiological measurements.

After 30 days, there was a significant average increase in International Index of Erectile Function scores. This is a validated 15-item questionnaire used to assess the severity of erectile dysfunction.11,12 Higher scores indicate greater erectile function.

Furthermore, the average score for the single question, “When you attempted intercourse, how often were you able to penetrate your partner?” rose significantly.

On the global assessment question, “Has the product you have been taking improved your erections?” an impressive 61.5% of men reported that the supplement improved their erections, an indication of a strong positive sexual experience.4

No hormone changes and no indicators of safety problems were identified in this study.

These findings indicate that Kaempferia extract (standardized to 5% 5,7-DMF) can improve not only erectile dysfunction specifically, but also other important parameters of the male sexual experience.

What You Need to Know

Naturally Enhance Sexual Function

- Erectile dysfunction affects millions of American men, and not all of them are elderly.
- Erectile dysfunction has many causes, including diminished brain processing of erotic stimuli and reduced blood flow to the penis.
- Powerful prescription erectile dysfunction drugs improve erectile function by inhibiting the PDE5 enzyme, allowing an erection to persist, but worrisome safety risks like blindness and permanent vision loss continue to plague this drug class despite the pharmaceutical industry’s attempts to downplay the risks.
- Extracts of Kaempferia parviflora have a centuries-old safety record, and gently support vascular health as well as emotional and psychological aspects of the sexual experience.
- Kaempferia extracts appear to enhance the brain’s perceptions of the sensory inputs required for sexual arousal and increase production of nitric oxide, which relaxes blood vessels to allow an erection to begin.
- Human studies now demonstrate that Kaempferia extract taken over time helps support male sexual function, supports penis size, improves erectile response time, and enhances overall sexual satisfaction.
Link between Erectile Dysfunction and Cardiovascular Disease

Men with erectile dysfunction have a higher risk of cardiovascular disease, and are more likely to die prematurely compared with men having normal erectile function. This is regardless of age and other cardiovascular factors.13,14

That’s because initiating, achieving, and sustaining an erection all depend on the mechanics of controlled blood flow through arteries and veins—the same blood-flow parameters that are required for good heart health. This makes erectile function a close indicator of how well vascular (blood vessel) and endothelial (blood vessel lining) processes are working.13,15

The most important common thread between erectile dysfunction and cardiovascular disease is endothelial dysfunction.16,17 This occurs when vital cells lining blood vessels fail to properly control blood flow and pressure, resulting in impaired distribution of blood flow.

A major cause of endothelial dysfunction is nitric oxide deficit.

While the first symptom of nitric oxide deficit may be erectile dysfunction, it is also an early indicator of vascular disorders that may result in heart attack or stroke.17-21

It’s critical for men to understand these facts, particularly because so many relatively young men are now experiencing erectile dysfunction, which may indicate early cardiovascular disease that would otherwise go undetected.13,14

This means:

• Erectile dysfunction may be an early warning sign of underlying atherosclerotic disease, but also

• Ideal treatment for erectile dysfunction would carry benefits, rather than certain risks, for the cardiovascular system.

How It Works

Animal and laboratory studies have taught us much about how Kaempferia extract improves sexual and cardiovascular health.

Two studies in sexually mature rats showed that ingesting the extract for four weeks improved the animals’ sexual motivation, as indicated by the time taken to mount a female.5,22

One of those studies also documented a significant increase in blood flow to the genitals, an important indicator of vascular health.5

In another study of aging rats, Kaempferia supplementation for three weeks resulted in improved copulatory and sexual behaviors, including shorter times to mounting females and penetrating them, and an increased number of mounting and insertion attempts.3

Significant Risk Factor

Nonarteritic anterior ischemic optic neuropathy (NAION) is the most common acute optic neuropathy in people older than age 50, with between approximately 1,500 to 6,000 cases occurring in the U.S. each year.24,25

This frightening condition is characterized by sudden, usually painless loss of vision in one eye, which confers an increased risk of vision loss in the other eye.

Many of the risk factors for developing NAION also predict erectile dysfunction (ED), such as hypertension, diabetes, hyperlipidemia, and smoking.26-28

Despite the pharmaceutical industry constantly downplaying persistent reports of patients developing NAION after taking Viagra® or other PDE5 inhibitors like Cialis® or Levitra®, regulatory agencies have requested that the prescribing information for all three marketed PDE5 inhibitors be updated to reflect this concern.

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Based on these and other findings, scientists suspect that *Kaempferia* has multiple key mechanisms of action. The first mechanism seems to activate brain responses to sexual stimuli.

*Kaempferia* extract appears to increase the overall desire to engage in sex once presented with sufficient sensory stimulation. This is an action unique to *Kaempferia* that is not a feature of the most common erectile-dysfunction drugs.

The second mechanism involves improvements in blood-vessel function throughout the body—with special impact on a highly sensitive recipient of blood flow, the penis. By improving arterial and endothelial function, *Kaempferia* extract permits better delivery of arterial blood to the penis.

This action produces the clinical effects of improved erectile response times, while increasing the overall size of the erect penis.¹,⁴

*Kaempferia* exerts this effect in large part by promoting the production of nitric oxide, which helps relax arteries everywhere in the body. It is this particular action that shows so much promise in preventing multiple types of cardiovascular disease as well as erectile dysfunction.⁷,⁹,²³

Additional Research

Studies in lab animals reveal that *Kaempferia* significantly improves blood flow through the spermatic artery, which provides blood to the testes.⁵

More detailed analyses show that the increased blood flow arises from favorable shifts in intracellular signaling molecules such as cyclic GMP (cGMP) and nitric oxide. These effects are also found in animals treated with the drug sildenafil (Viagra®).⁹ However, these vascular effects are far more potent with prescription PDE5 inhibitors.

In this study, the vascular benefits of *Kaempferia* were identified not only in arteries supplying the penis and testes, but also in the heart, contributing to overall cardiovascular health.

In isolated portions of rat aorta, the active component of *Kaempferia*, 5,7-DMF triggered significant relaxation, which would produce a larger space for blood to flow through. These shifts were also traced to higher levels of muscle-relaxing nitric oxide and cGMP, as well as beneficial shifts in calcium ion movements.⁷

*Kaempferia* extract was shown to share an important mechanism of action with drugs sold for erectile dysfunction, i.e. inhibition of the enzyme PDE5.⁶ Again, however, vascular effects mediated through inhibition of this enzyme are far more potent with PDE5 inhibitor drugs, though safety risks are also linked to this drug class’s potency.

This enzyme (PDE5) normally sends a signal to reduce blood flow through arteries in the penis, which causes penile vascular pressure to drop and the erection to wilt. Inhibiting the PDE5 enzyme helps sustain the erection effectively.⁹

Taken together, these findings on *Kaempferia* extract show it can benefit male sexual health for the very reasons it favorably affects systemic vascular health. By allowing arteries to relax and offer minimum resistance to blood flow, this ginger-like root extract offers intriguing potential systemic benefits.
Summary
Sexual dissatisfaction plagues millions of American men.1,3,11
Men with diminished sexual function are at greater risk of early death from cardiovascular disease. Drugs like Viagra® or Cialis® rapidly improve blood flow to the penis and help sustain an erection. However, price gouging and worrisome safety concerns plague this potent drug class. In addition, they are of little use in promoting the psychosocial/emotional aspects of a sexual encounter.

Kaempferia parviflora provides the opportunity for a more comprehensive approach with sustained use over time.

Data suggest that a specific Kaempferia extract taken over time helps safely support and enhance the sensory experience of sex, making an erection (and subsequent satisfaction) more likely.

This ginger-like extract safely supports production of blood vessel-relaxing nitric oxide, which helps increase blood flow to the penis and arteries throughout the body. In-vitro research shows that this extract targets the same enzyme as powerful drugs prescribed for erectile dysfunction.

Human studies show that, over time, Kaempferia supplementation gently supports erectile function, with modest improvements in penile circumference (girth), and length, all the while supporting a generally more satisfying sexual experience.

Most importantly, because erectile dysfunction can be an indicator of life-threatening cardiovascular disease, supplementing with Kaempferia extract may offer the dual benefit of safely supporting sexual performance while potentially providing sustained, gentle support for the aging vascular system.

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
29.
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MIT researchers discovered and patented magnesium L-threonate based on its unique ability to boost brain levels of magnesium.

Rapid absorption and ability to enter the brain enables this magnesium to structurally reverse certain aspects of brain aging.1-4

A recent human study demonstrates the benefits of magnesium L-threonate in adults with cognitive dysfunction, sleep disorders, and anxiety.1

The most startling finding is a reversal of more than nine years in clinical measures of brain aging in people who supplemented with magnesium L-threonate.
Magnesium L-threonate (MgT) was developed at the Massachusetts Institute of Technology.²

MgT (pronounced “Mag T”) is special because of the way it boosts brain magnesium levels when taken orally. This effect is due to its unique ability to cross the blood-brain barrier.²

Research has shown that once MgT gets into the brain, it increases the density of synapses, which are the communication connections between brain cells.¹

This is critical because loss of synaptic density is associated with brain shrinkage and cognitive decline.⁵,⁶

Published Human Data

Scientists at three independent institutions carried out a randomized, double-blind, placebo-controlled clinical trial of MgT in older adults with cognitive impairment.¹

To participate in the study, candidates had to be between the ages of 50 and 70, and have self-reported complaints of memory problems, sleep disorders, and anxiety.¹

This study was based on the premise that sleep and anxiety disorders correlate with perceived memory loss.⁷ Those who report mild cognitive impairment and who also have sleep and anxiety disorders are more likely to develop Alzheimer’s.¹,⁸-¹¹

In this multi-center study, participants were randomly assigned to receive placebo or magnesium L-threonate in the dose of 1,500-2,000 mg each day (depending on body weight) for 12 weeks.

Baseline cognitive testing commenced before people started taking MgT or placebo. These cognitive tests were then repeated at six-week and 12-week points.¹

The following four separate tests were used to evaluate cognitive function:

- Executive function
- Working memory
- Attention
- Episodic memory (ability to recall fleeting events)

Findings from this study revealed:

1. MgT improved body magnesium status. After 12 weeks researchers found significant increases in red blood-cell concentration and in urinary excretion of magnesium in the treated group.¹ Increased urinary excretion indicates that large amounts of magnesium have been absorbed, while increased levels in red blood cells show high circulating levels of magnesium in the body.

2. MgT improved cognitive abilities. Using a test of visual attention and task switching, researchers saw significant increases in performance speed for executive function and cognitive processing. These benefits appeared as early as week six on some of the tests.¹ Most tellingly, the overall composite scores for all tests of the MgT-supplemented group increased significantly compared with baseline scores and with those of placebo recipients at weeks six and 12.

3. MgT reduced fluctuation in cognitive ability. When cognitive functions are worse on some days than others, it is a warning sign of developing mild cognitive impairment.¹²,¹³ In the present study, while placebo recipients showed considerable fluctuation in their cognitive scores, those in the MgT group had primarily positive changes.¹

4. MgT reversed clinical measures of brain aging. This is a significant finding, which we’ll explain in more detail in the next section.
Understanding Your Brain Age

Brains do not functionally age at the same rate as whole-body chronological age.

For example, a 60-year-old person can have a brain age of 70, meaning they are functioning at an “older” level.¹

This variance of brain aging is based on measurable performance and physiological parameters.¹⁴⁻¹⁷

In the MgT study discussed earlier, the average chronological age of all subjects in the study was 57.8 years. Their average baseline “functional” brain age, however, was estimated to be 68.3 years.

In other words, the study subjects were about 10 years older in terms of their cognitive function.¹

What the researchers found next was remarkable.

The average functional brain age of subjects receiving MgT supplements decreased from an older 69.6 years at the start of the study, to 60.6 after just six weeks of treatment.

That’s a nine-year reduction in brain age in a matter of weeks.¹ This improvement continued until week 12 with total reduction in brain age of 9.4 years.

By the end of the study, cognitive abilities were brought almost back to normal for their younger chronological age in subjects who took MgT.

Support Brain Function With Magnesium L-Threonate

- A new human study using a unique, highly-available form of magnesium, magnesium-L-threonate, or MgT, shows that 12-week administration not only boosts performance on individual cognitive tests, but also reverses brain aging by more than nine years in older adults with cognitive impairment.

- Our brains shrink as we age, victims of steady declines in the numbers and functions of our brain cells and their cerebral “switchboards” known as synapses.

- Loss of those synapses is currently the best predictor of cognitive decline, the slowing and wandering of our wits as we age.

- Scientists now believe that preventing the loss of synapses, and promoting their density, has incredible potential for preventing cognitive decline.

- Animal studies confirm that MgT has remarkable capacity to promote new synapse formation and enhance plasticity in ways that preserve youthful brain function.

- We only get one brain apiece to last our entire lives – MgT supplementation appears to be indispensable in preserving our best brain function.
In other words, MgT treatment was found to reverse these measured aspects of brain aging until it was nearly identical to their cognitively healthy peers.1

Overall, the results of this clinical trial are potentially game-changing for the aging population. The study found that MgT significantly improved cognitive performance on several standardized tests, while reducing the fluctuations in performance that are a warning of developing cognitive impairment in the future.

It also showed a reversal of the brain age of MgT-supplemented subjects by nearly a decade.

How MgT Regenerates Aging Brains

The study detailed above shows that MgT improved cognitive function in aging adults, and helped “rejuvenate” their brains towards normal function for their age.

The key takeaway of this study is that achieving higher brain levels of magnesium results in a younger brain.

Previous studies give us insight into how. They demonstrate that increasing magnesium concentrations in cultured brain cells from the hippocampus (the area of the brain where memories are stored and retrieved) increases both synaptic density and brain plasticity.18,19

Here’s why this is important:

• **Synaptic density** is a measure of the structural integrity of brain synapses. The greater the synaptic density, the more efficient the cognitive processing.20

• **Plasticity** is a measure of how readily synaptic connections can change with new stimuli. It is the equivalent of learning at the cellular level.21-24

Getting more magnesium into brain cells is not as simple as adding it to the diet. That’s because of the complex regulatory functions of the blood-brain barrier.2,25

As a result, consuming a typical magnesium compound rather than magnesium L-threonate (MgT) doesn’t affect brain functions like cognition and memory because much of it does not reach the brain.2

Research shows that MgT increases synaptic density in precisely the brain regions most crucial to executive function and memory.2-4 These are the two most critical processes in something as simple as recognizing that a red light means “stop.”

Studies in aging rats and in a mouse model of Alzheimer’s disease have also shown that MgT enhances synaptic plasticity and is capable of reversing cognitive impairment.2,4

Overcoming Anxiety

Animal studies demonstrate that MgT helps reduce fear-related memories, and prevents fear memories from becoming over-generalized—actions that contribute directly to reductions in anxiety.3,27

While fear plays an important role in keeping us safe from real threats, persistent fearful memories from a specific traumatic occurrence, such as a car accident, can cause us to become anxious and even paralyzed into inactivity.3,27,28

A supplement like MgT that can squelch fearful memories, while also helping our brains put them into context, represents a real step forward in addressing debilitating elements of brain aging.
Summary

The mineral magnesium has emerged as a major contributor to the integrity of microscopic synaptic structures of the brain.

But getting high amounts of magnesium into the brain is complicated because it has difficulty penetrating the blood-brain barrier.

**Magnesium L-threonate**, or MgT, is unique because it enters the brain more efficiently and reaches brain cells, offering a novel delivery system for this valuable neurochemical.

In a remarkable human study, MgT was found not only to effectively boost brain magnesium concentrations, but also to significantly improve performance and speed on a battery of cognitive tests in adults with early cognitive impairment.

Even more dramatically, MgT supplementation reduced brain age by more than nine years. That represents a reversal in these clinical measures of brain aging.

MgT is available as a dietary supplement for anyone interested in proactive brain-aging protection.

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


JUNE 2018 | LIFE EXTENSION | 37
Humans don’t manufacture vitamin C internally, so it must be obtained through dietary sources or supplements. Vitamin C is water soluble and needs to be constantly replenished.¹

Fortunately, a flavonoid known as dihydroquercetin functions as a vitamin C “supercharger” that helps maintain its concentration throughout the body.²³

References

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

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**Neuro-Mag®**

**THE SMART MAGNESIUM**

Supports Improvement in Overall Cognitive Ability*

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**Neuro-Mag® (Magnesium L-Threonate)** was specifically formulated by MIT scientists to be uniquely absorbable by brain and nerve cells.

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**Neuro-Mag® Magnesium L-Threonate**

Item #01603 • 90 vegetarian capsules

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**Neuro-Mag® Magnesium L-Threonate Powder**

Item #02032 • 93.35 grams of powder

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For full product description and to order **Neuro-Mag® Magnesium L-Threonate** or **Neuro-Mag® Magnesium L-Threonate Powder**, call 1-800-544-4440 or visit www.LifeExtension.com

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Life Extension®’s Optimized Cran-Max® with Ellirose™ uniquely complements whole cranberry’s effectiveness for urinary tract health. Optimized Cran-Max® provides benefits similar to seven 8-oz glasses of Ocean Spray® Cranberry Juice Cocktail in each daily dose, but without the simple sugars and empty calories.

Optimized Cran-Max® with Ellirose™
Item #01424 • 60 vegetarian capsules

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For full product description and to order Optimized Cran-Max® with Ellirose™, call 1-800-544-4440 or visit www.LifeExtension.com

Caution: Avoid use during pregnancy.

Cran-Max® and Bio-Shield® are registered trademarks of Pharmachem Laboratories, Inc. Ellirose™ is a trademark of Naturex, Inc.

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Up to 7-Times Better Absorption

Super Bio-Curcumin®

Super Bio-Curcumin® features a patented extract from turmeric root that absorbs up to 7 times better than standard curcumin.

Advanced Bio-Curcumin® contains the same optimal potency of curcumin with the added benefits of ginger and additional turmeric extracts.

Suggested dose for either Bio-Curcumin® formula is one capsule daily for otherwise healthy individuals.

For full product description and to order Super Bio-Curcumin® or Advanced Bio-Curcumin® with Ginger & Turmerones, call 1-800-544-4440 or visit www.LifeExtension.com

Retail  Your
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Super Bio-Curcumin®
Item #00407 • 60 vegetarian capsules

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Advanced Bio-Curcumin® with Ginger & Turmerones
Item #01924 • 30 softgels

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Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC. U.S. Patent Nos. 7,883,728, 7,736,679 and 7,879,373.
For years, scientists have been intrigued by pomegranate’s potential anti-cancer benefits.

Researchers are now discovering bioactive compounds in pomegranate can help thwart cancer at multiple stages of the development process.¹⁻³

Pomegranate compounds are demonstrating the ability to protect against initial DNA mutations and impede existing cancers from spreading.¹⁻⁷

All parts of the pomegranate plant, including the fruit, peel, and seeds, are rich in compounds that protect against chemical and physical threats to our cells.

These compounds include several families of polyphenols called tannins and flavonoids.¹⁻³,⁵,⁶,⁹
Pomegranate's Multiple Anti-Cancer Actions

Pomegranate extracts help combat cancer in several of the stages of tumor development. Firstly, they interfere with multiple factors that damage DNA and cause the crucial first mutations of genetic material.\(^1,10,11\)

If a mutation does occur, pomegranate extracts can:

- Impede the **cell replication cycle**.\(^1,7,12-14\)
- Facilitate the death of mutated cells by **apoptosis**.\(^6,9,12,15-17\)
- Impede new blood-vessel growth, or **angiogenesis**. This helps starve rapidly dividing tumors of nutrients and oxygen.\(^9,18-20\)

If a malignant cell mass still manages to develop, pomegranate extracts impair its ability to invade local tissues and metastasize to distant ones.\(^12,15,21\)

**A Potent Cancer Blocker**

Pomegranate extracts also have the unique ability to promote the production of a protective enzyme known as **paraoxonase-1**, or **PON-1**.\(^8,22-30\) PON-1 blocks the inflammation and oxidative stress that can contribute to the initial DNA damage that can trigger cancer.\(^31-41\)

People with cancer have been found in multiple studies to have reduced levels of PON-1, while those with the poorer prognosis often have the lowest levels of PON-1 activity.\(^31-41\)

Restoring and promoting PON-1 activity may be a powerful means of blocking cancer formation at its earliest stages—while reducing oxidative stress and inflammation can be beneficial at multiple stages.

As we'll see next, these **anti-cancer** actions play a role in pomegranate’s ability to help prevent four of the most common—and deadliest—cancers: prostate, breast, colorectal, and lung.

**Pomegranate Slows Prostate Cancer Growth**

Prostate cancer is the second leading cause of cancer-related death in American men.\(^42\) Both animal and human studies have shown pomegranate’s ability to slow prostate tumor growth and prevent prostate cancers from forming.

Animal studies have found that pomegranate extracts slow prostate tumor growth in the lab and in mice prone to prostate cancer.\(^16,19,42-46\) The extracts work by inhibiting cell proliferation (inducing apoptosis), reducing inflammation, and inhibiting new blood-vessel formation—many of the anti-cancer mechanisms mentioned above.\(^6,16,19,42,45\)

In the most dramatic of these studies, 100% of mice bred to be prone to prostate cancer developed tumors by 20 weeks, compared to only 20%-30% of those receiving pomegranate fruit extract.\(^43\) More importantly, the supplemented mice lived as much as 114% longer than the control animals.

Human studies have also shown pomegranate’s ability to slow prostate cancer growth, as demonstrated by PSA scores.

Prostate-specific antigen (PSA) is a reliable marker of the rate of prostate cancer growth. The **PSA doubling time** is the standard indicator of tumor growth rate. The shorter the doubling time, the more aggressive the tumor.

Among men with rising PSA, pomegranate supplementation lengthened the PSA doubling time by 1.6- to 3.6-fold.\(^47,48\)

This represents increases of 6 to 39 months in the time it took the PSA to double, a respectable slowing of tumor growth by any standard.\(^47,48\)
Protection Against Breast Cancer

Breast cancer is the most common cancer among all women. It strikes nearly a quarter of a million women each year, killing more than 41,000.

Most breast cancers are hormone-dependent, meaning that high levels of estrogen help the cancer to grow and spread.

Anti-estrogen therapies are a common form of treatment. They work by either lowering estrogen levels or by stopping estrogen from stimulating cancer growth.

A smaller percentage of breast cancers are hormone-independent, making them harder to treat using anti-estrogen therapies.

Pomegranate extracts have shown preventive activity in laboratory studies against estrogen-dependent breast cancer cells, with a pair of related human cancer cell studies finding that pomegranate peel and seed extracts inhibited the growth of breast cancer cells by more than 80%.

Pomegranate has the unique ability to interact with the body’s normal hormone metabolism, making it especially beneficial against the more common hormone-dependent breast cancers.

Compounds found in pomegranates can inhibit the enzymes that convert less active forms of estrogen into cancer-promoting estrogen molecules.

These results show pomegranate can block specific pathways that link estrogen metabolism to breast cancer.

Early Promise in Colorectal Cancer Prevention

Colorectal cancers are the third leading cause of cancer-related deaths in the U.S., accounting for more than 50,000 fatalities each year.

Colon cells are constantly exposed to the flow of waste matter, toxins, and other materials capable of imposing powerful oxidative stress on cells. This makes them prime candidates for DNA damage, inflammation, and other factors that contribute to cancer.
The good news about colorectal cancers is that these tumors are also directly exposed to beneficial nutrients that we ingest.

Pomegranate extract is one of the best candidates for colorectal cancer chemoprevention because its polyphenols are delivered directly to human colonic tissues after consumption.56

In animal models of colorectal cancer, pomegranate extracts consistently—and significantly—inhibited tumor growth, reducing both the size and number of tumors.57,58 Pomegranate’s anti-cancer mechanisms included upregulating cellular anti-cancer enzyme systems.57,58

One of pomegranate’s most abundant classes of polyphenols, punicalagins, can inhibit enzymes capable of converting pro-carcinogens (precursors of cancer-causing molecules) into active carcinogens.59

Promising human studies have shown important alterations in genes and other markers of colorectal cancers when people supplement with pomegranate extracts.56,60,61

Lung Cancer

Pomegranate extracts have demonstrated properties against lung cancers.

In particular, pomegranate extracts have anti-inflammatory properties. This is valuable in reducing cancer risk because of the tumor-promoting effects of chronic inflammation.14,20

In animal models of lung cancer, pomegranate extracts reduced the numbers of tumors10,20 by as much as 66% compared with unsupplemented animals.20 These beneficial effects are attributed to slowing cell-replication and amplifying cell death by apoptosis.4,6,9,12,52

Finally, pomegranate extracts reduce production of specialized enzymes that cancer cells use to invade healthy cells.12 This property can help prevent cancer cells from spreading to other tissues, which lowers the deadliness of any cancer.

Summary

Pomegranate extracts have numerous properties capable of combatting cancer at multiple stages of the development process.

Studies show that pomegranate extracts protect DNA from mutations that trigger the earliest carcinogenic changes, inhibit cancer-cell growth, and help prevent cancer from spreading.

Pomegranate extracts show promise in preventing the growth and spread of four common types of cancer cells: prostate, breast, colon, and lung.

Their broad range of anti-cancer activities, attributable to their rich polyphenol content, makes them an excellent food and/or extract to ingest on a regular basis.

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


PQQ (pyrroloquinoline quinone) activates genes involved in the production of cellular energy.¹-⁵

Studies show PQQ supports heart health and cognitive function, complementing CoQ10.⁶,⁷

In fact, just 20 mg per day of PQQ plus CoQ10 promotes memory and attention in aging individuals.⁸

This is the highest quality PQQ available on the market today.

For full product description and to order PQQ Caps or any other PQQ-containing formulas, call 1-800-544-4440 or visit www.LifeExtension.com

Also available are 10 mg PQQ caps (Item #01500) and 100 mg Super Ubiquinol CoQ10 (Item #01733).

References
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Kenkoh® IS JAPANESE FOR HEALTH AND BEAUTY
Kyu-Kichi Yamanashi invented the Kenkoh massage sandal in Japan in 1962. He designed the unique foot bed to mimic two ancient healing techniques that saved his life: Aodake-Fumi (stepping on bamboo) and Sokushindo (Japanese reflexology), meaning “the path that leads to the heart.”
**Pomegranate Complete** combines extracts from the whole fruit, flower, and seed oil to support system-wide health.

It augments these polyphenols with other pomegranate plant compounds to help ease inflammation and combat age-related metabolic changes.

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

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Clinical trials demonstrate that the plant extracts in ArthroMax® Elite support healthy inflammatory response, help maintain healthy connective cartilage tissue, and promote comfortable joint function.

Each tablet provides optimal potencies of Chinese skullcap, cutch tree and white mulberry. Suggested dose is one tablet daily, with or without food.

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

Keep out of reach of children. Do not exceed recommended dose.

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Few people consistently eat enough **plant** foods to protect against age-related decline. Commercial multivitamins do not provide vital plant components needed for good health.1-3

**Life Extension Mix™** is superior to other multi-vitamins—partly because it provides a broad array of **fruit** and **vegetable** extracts.

Rounding this out are high-potency **vitamins**, **minerals**, **botanical extracts**, and more.

When **Life Extension Mix™** was launched in 1983, it provided an efficient way to obtain critical nutrients in one formula. **Life Extension Mix™** has been upgraded over the past 35 years to reflect new findings in the scientific literature. The full dose can be obtained for as little as $1.34 a day!

**Life Extension Mix™** now provides **ashwagandha** extract, that is demonstrating new health benefits you will soon learn about.

**Life Extension Mix™** requires only 12 capsules/day (compared with 14 in its previous version) or just 8 tablets/day compared to previous 9 tablets!

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**References**

The discovery of the human microbiome is changing the ways we think about health and disease. Microbiome is the term for the trillions of living organisms that reside in and on the human body. An estimated 100 trillion microorganisms live in the gut alone—that’s up to ten times the number of cells that make up the body itself.¹

While we’re only beginning to understand the impact of the microbiome on our daily health, it’s clear that the bacteria, diversity, and overall balance are intimately related to our states of health and disease.¹

More than 70% of the human immune system is found in the lining of the gut.²

Based on this information, researchers have now found a new kind of health-promoting therapy: targeted cultures of beneficial bacteria (probiotics) that are fine-tuned to modify imbalanced microbiomes back into a healthy equilibrium.
Equally compelling findings now exist for dysbiosis of the oral and pharyngeal (throat) microbiomes, which have been implicated in tooth cavities, gingivitis/periodontitis (gum disease), and susceptibility to respiratory infections and sore throats, respectively.18-23

**Probiotics Rebalance a Dysbiotic Microbiome**

What can we do to restore the all-important balance to dysbiotic microbiomes?

The usual response of mainstream medicine is pharmaceuticals, but with few exceptions, drug therapy has not yet been proven effective in microbiome-related disorders. Killing bacteria with antibiotics is like using a sledgehammer to kill a fly—it’s much more destructive than effective, killing off dozens or hundreds of healthy bacteria to cope with a few unhealthy bacteria.

Fortunately, we have a growing array of weapons in our arsenal to fight dysbiosis and restore healthy, balanced microbiomes, in the form of beneficial bacteria generally known as probiotics. Probiotic bacteria are derived from populations of known beneficial microorganisms, which produce specific compounds that contribute to human health, or help to suppress the less-beneficial microorganisms. Humans have been consuming probiotics for millennia in the form of fermented foods like yogurt, pickles, and sauerkraut, which are packed with billions of health-promoting bacteria.24-27

Remarkable progress has been made in the past few years to produce highly specific microbiome-targeted probiotics. Today, there are probiotic formulations available to help maintain overall balance in the gut microbiome, help prevent heart disease, improve mood disorders, enhance our immune systems, reduce our allergy risks, and even bolster oral health and ease sore throats.

Let’s look at each of these areas briefly, to understand the promise of the targeted probiotic revolution.

**Multiple Bacterial Strains for Gut Microbiome Balance**

Among the oldest and best-recognized probiotic bacteria, members of the *Lactobacillus* and *Bifidobacteria* families stand out for their safety and effectiveness.28,29 Members of these groups have many gut-health benefits, which include reduced inflammation and improved cell-to-cell communications.30

Targeted probiotics have also been shown to improve healthy gene expression in intestinal immune cells—that gigantic community of human immune tissue that makes up more than 70% of our total immune function.31
Studies show that restoring the gut content of “friendly” bacteria can support healthy immune function. A balanced probiotic combination takes advantage of all of these findings, and adds an additional vital piece of technology, a specialized capsule that keeps the valuable bacteria alive through the path from the mouth, through the acid-filled stomach and past the enzyme-rich small intestine—a major challenge in delivering probiotics to their target environment in the large intestine.

This high-tech formulation contains a proprietary blend of six proven probiotic strains, for a total of 15 billion microorganisms per dose. Designed to cling to the intestinal tract’s lining, these six strains consist of:

- *Lactobacillus acidophilus* LA-14
- *Bifidobacterium lactis* BL-04
- *Lactobacillus paracasei* LPC-37
- *Lactobacillus rhamnosus* LR-32
- *Bifidobacterium bifidum/lactis* BB-02
- *Bifidobacterium longum* BB536®

For anyone who wants to address a general state of dysbiosis of the kind most of us have when we eat the occasional processed food, fail to get enough exercise, drink too much alcohol, or even simply live a stressful life, this balancing formulation is a wise choice.

**Microbiome and Disease**

- We share our bodies with trillions of microorganisms that contribute importantly to our state of health or disease.
- Collectively called the *microbiome*, these myriad species can, when in proper balance, protect us from underlying inflammation, leaky gut, and other fundamental disorders that lead to ill health.
- When imbalanced, or *dysbiotic*, microbiome communities can ravage our health and leave us vulnerable to a wide range of chronic diseases.
- Drugs don’t help, and in fact can often make matters worse by suppressing growth of beneficial organisms.
- *Probiotics*, living bacteria with beneficial properties, can restore balance to dysbiotic microbiomes, permitting a self-healing process to begin.
- Studies show that carefully designed, scientifically supported probiotic bacteria, alone or in combinations, can improve many of the dysbiosis-associated disorders from which we suffer, including general gut health, cardiovascular and brain health, and immune function.
- Other probiotic formulations now show promise in reducing the burden of tooth decay, gingivitis, and throat infections by modulating oral and pharyngeal microbiomes.
- Eventually, we all fall victim to dysbiosis and its dangerous, lifelong consequences. Now we can all protect ourselves by using valuable, living communities of bacteria to rebalance ailing microbiomes.
How the Microbiome Controls Your Health

Probiotic Formulation Boosts Immune Function

The human immune system is one of nature’s recurring miracles, capable of discerning minute differences in molecular structures to help protect us from infections, as well as detecting and destroying incipient cancer, shutting down its destructive machinery to prevent damage to our own tissues.

The human intestinal tract is where our immune systems meet our gut microbiome. It is now becoming clear that the gut microbiome plays an outsized role in “teaching” the immune system to distinguish between our own cells and other threatening cells and molecules. When the gut microbiome and immune system work together, we develop appropriate immune tolerance, so that our bodies learn to attack only real offenders and avoid destructive impact on our own tissues.

Cardiovascular disease remains the leading killer of older Americans, but recent findings linking cardiovascular health to gut microbiome imbalance may offer new hope in the prevention arena. Many of the factors that increase heart-disease risk are influenced by gut dysbiosis: inflammation, cholesterol and other lipid levels, and even the tendency for blood to clot.

A highly specific probiotic has now been developed, comprised of a single beneficial strain of Lactobacillus. Called Lactobacillus reuteri 30242, this unique microorganism has been shown in clinical trials to safely support healthy cholesterol in adults who are already within the normal range. Furthermore, L. reuteri 30242 has the ability to support healthy levels of a cholesterol carrier protein called apoB-100, which influences how and where cholesterol is delivered to body tissues.

This unique probiotic strain also reduces a key marker of inflammation associated with cardiovascular disease, C-reactive protein, or CRP.

Finally, L. reuteri 30242 can support healthy levels of the blood clotting factor fibrinogen, which may help to reduce the risk of artery-blocking clots that can lead to heart attacks or stroke.

People with known cardiovascular risk factors should pay special attention to L. reuteri 30242 as part of their daily supplement regimen.

Mood Improvements With Probiotic Combination

Gut microbes help process a wide range of signaling molecules, including many essential hormones and neurotransmitters that brain cells use to communicate and send impulses. And inflammatory changes, driven in part by gut dysbiosis, can contribute to mood disorders such as major depression.

Researchers around the world have been chasing formulations capable of manipulating gut microbiome constituents to favorably affect brain function. A leading contender has emerged in the form of two specialized bacterial strains, Lactobacillus helveticus R0052 and Bifidobacterium longum R0175.

Human clinical studies on this specialized combination have shown significant improvements in mood, accompanied by reductions in perceived stress levels, while also demonstrating enhanced relaxation abilities.

People with depression and/or anxiety should seriously consider use of this probiotic combination as a way of lightening mood and potentially easing symptoms of anxiety.

Probiotics Support Heart Health

Cardiovascular disease remains the leading killer of older Americans, but recent findings linking cardiovascular health to gut microbiome imbalance may offer new hope in the prevention arena. Many of the factors that increase heart-disease risk are influenced by gut dysbiosis: inflammation, cholesterol and other lipid levels, and even the tendency for blood to clot.

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People with known cardiovascular risk factors should pay special attention to L. reuteri 30242 as part of their daily supplement regimen.
This probiotic blend is specially designed to support immune health by enhancing IgA levels year-round. It contains *Bifidobacterium lactis* BS01, *Lactobacillus plantarum* LP01, *L. plantarum* LP02, *L. rhamnosus* LR04, and *L. rhamnosus* LR05, which have been shown to reduce the incidence and severity of respiratory diseases during the cold season. The formulation also includes *Bacillus subtilis* CU1®, which has been shown to stimulate immune responses in elderly subjects during the dangerous winter season.

Although this combination has been especially effective in preventing wintertime infections, there is every reason to believe that its IgA-enhancing properties can provide important year-round immunological support.

**Throat Protection with Specialized Probiotic**

The throat and oral microbiomes are also important in protecting our health. Makeup of the throat (pharyngeal) microbiome may be particularly important in preventing wintertime sore throats, including strep and viral infections.

A specialized strain of probiotic called *Streptococcus salivarius* K12 is a harmless strep species with unique weapons: it releases two potent lantibiotics (bacterially-produced antibiotics that destroy other bacteria). In particular, the lantibiotics produced by *S. salivarius* K12 target *S. pyogenes*, the species responsible for the classic strep throat.

A human study showed that *S. salivarius* K12 in the form of a slow-release chewable tablet delivering a billion colonies of the organism significantly reduced (by more than 90%) episodes of strep throat, while a control group showed no change. This study demonstrated an enormous 30-fold reduction in the number of days on antibiotic treatment, a benefit to the entire microbiome.

For anyone who wants freedom from strep throat, and to reduce their annual antibiotic exposure, *S. salivarius* K12 is the probiotic of choice.

**Oral Health Promotion With Paired Probiotic Lozenge**

A tremendous proportion of U.S. adults suffer from oral health disorders, particularly cavities and the gum disease gingivitis (which may progress to periodontitis, resulting in tooth loss). These disorders are not only uncomfortable and unsightly, but also have been associated with higher risks of systemic disease, especially cardiovascular disorders.

Dental plaque is a leading contributor to cavities and gingivitis and is a rich environment for destructive bacteria that contribute to oral dysbiosis.

Another unique strain of *S. salivarius*, called M18, produces its own lantibiotics targeting *S. mutans*, a major component of plaque and a known cause of cavities. This bacterium also produces enzymes with the potential to weaken and loosen plaque on teeth and gums.

A clinical study of *S. salivarius* M18 vs. placebo showed a significant reduction in plaque scores in treated, but not placebo, subjects.

A second component of this formulation is *Lactobacillus plantarum* L-137, a probiotic capable of activating human immunity and reducing inflammation. In a human clinical trial, this probiotic reduced probing depth, the depth of the pocket between tooth and gum where periodontal disease sets in and destroys both tooth and bone.

Daily supplementation with this proven probiotic combination is an excellent way to augment regular brushing and flossing.
Allergy Relief

Even seasonal allergic symptoms can be driven—and remedied—by microbiome modulation involving the immune system.

That’s good news for the 30% of adults (about 50 million) who suffer from seasonal allergies in the U.S. In fact, allergies rank sixth in leading causes of chronic illness in America, costing society in excess of $18 billion. Sadly, much of that money is being wasted, while allergic people continue to suffer needlessly.

Virtually all allergy remedies on the market today attack symptoms from the end of a long biochemical-signaling cascade. None of them set to work on the primary source of allergic symptoms: an imbalance in the immune system’s regulatory network that promotes the activity of reactive cells over that of more nuanced, regulatory cells.

Now, thanks to advanced scientific breakthroughs, two ingredients have been identified that act at the top of that signaling cascade, effectively retraining the immune system to take pollen and other allergens in its stride, and muting the excessive inflammatory responses that otherwise produce irritating allergy symptoms.

Studies show that between them, this combination of dried baker’s yeast fermentate, a yeast fermentation product, plus heat-treated Lactobacillus L-92 (HT L-92), an inactivated probiotic strain, can significantly and substantially reduce seasonal allergy symptoms, providing 43% fewer days with nasal congestion, a 24% reduction in swollen nasal passages (as evaluated by a physician), and a 31% reduction in eye symptoms.

Summary

We’re experiencing the beginning of a true medical revolution with the discovery of the trillions of bacteria that make up our microbiome. These bacteria provide countless opportunities to improve and protect our health through careful balancing of the community composition.

Imbalanced (dysbiotic) microbiomes are now associated with practically every chronic disease that plagues humanity. And restoring balance has been repeatedly shown to reverse the consequences of dysbiosis, to protect us from disease, and to enhance our health and the prospects for longevity.

We can’t treat dysbiosis with drugs.

Studies now show that probiotic supplementation can rebalance dysbiotic microbiomes and protect us from disorders of the gut, brain, heart, and immune system. Similarly, probiotics targeting the oral and throat microbiomes can protect us against dental disease, gingivitis, and throat infections. These potent formulations are only the beginning of a new era in medicine, when we learn to engage in partnerships with the other living beings that share our bodies and encourage them to ease us into better biological balance for longer, healthier lives.

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


44. Root-Bernstein R. Autoimmunity and the microbiome: T-cell receptor mimicry of “self” and microbial antigens mediates self tolerance in holobionts: The concepts of “holoautoimmunity” (TcR-mediated tolerance for the holobiont) and “holoautoimmunity” (loss of tolerance for the holobiont) are introduced. *Bioessays.* 2016;38(11):1068-83.


Slow Down AGING

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

Super Carnosine provides 500 mg of carnosine along with luteolin to inhibit inflammatory factors and fat soluble vitamin B1 (benfotiamine) to further impede glycation reactions.

Mitochondrial Energy Optimizer contains the same carnosine dose with R-lipoic acid, benfotiamine, taurine, luteolin, and PQQ to provide broad-spectrum support.

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

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
NAD⁺ levels plummet with age but increase in response to nicotinamide riboside.

Optimized NAD⁺ Cell Regenerator™ combines 250 mg of nicotinamide riboside with resveratrol and other plant extracts.

For resveratrol to deliver functional results, it requires NAD⁺.

For those already taking resveratrol, we also offer NAD⁺ Regenerator™ that provides 250 mg of nicotinamide riboside.

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

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HEALTHY FLORA

One of the most exciting fields of scientific research is focused on the trillions of bacteria that live in our bodies.

Researchers have discovered that these flora play an enormous role in immunity as well as overall health.

Life Extension’s FLORASSIST® products can help maintain that important digestive environment and support healthy function of the heart, throat, mood, digestive tract, oral hygiene, immune system, and nasal passages.

FLORASSIST® Gi with Phage Technology
• Provides broad spectrum of healthy bacteria for the digestive tract plus phages that target undesirable intestinal bacterial strains.

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Item #02125 - 30 liquid vegetarian capsules

FLORASSIST® Heart Health
• Supports heart health.

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Item #01821 - 60 vegetarian capsules

FLORASSIST® Prebiotic
• Promotes friendly bacteria.

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Item #02203 - 60 chewable tablets

FLORASSIST® Throat Health
• Probiotic defense for your throat.

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Item #01920 - 30 lozenges

For full descriptions and to order any of these FLORASSIST® products, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
HEALTHY YOU!

FLORASSIST® Oral Hygiene
- Supports healthy bacteria in gums.

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Item #02120 - 30 lozenges

FLORASSIST® Nasal
- Balances immune response to seasonal changes.

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Item #02208 - 30 vegetarian capsules

FLORASSIST® Mood
- Positively influences the nervous system for healthy mood.

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Item #02000 - 60 capsules

FLORASSIST® Immune Health
- Protects respiratory system from year-round immune challenges.

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Item #02124 - 30 vegetarian capsules

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Vitamin D: Surprising Link Between Bone Health and Metabolism

Vitamin D is best known for bone health, but its potential role in cancer prevention has made it one of the most popular supplements today.

A recent study reveals a new benefit of vitamin D: metabolic health.

In a new article, Italian scientists reviewed previous studies on vitamin D and found a connection to bone and metabolic health.

In their review of the literature, the researchers showed strong associations between inadequate vitamin D levels and inflammation, osteoporosis, insulin resistance, and type II diabetes.¹

The scientists concluded that vitamin D may become an important therapeutic agent in the fight against metabolic disease, as well as disorders caused by inflammation.
**Vitamin D: The Bone Vitamin**

For older individuals, vitamin D deficiency contributes to osteoporosis and higher fracture risk. Educated seniors supplement with vitamin D and other nutrients to reduce their loss of bone density.

Vitamin D has anti-inflammatory properties that are also important when it comes to preventing osteoporosis.

In recent years, we have come to understand that osteoporosis is an inflammation-driven condition. Inflammation disrupts the delicate balance between bone breakdown (resorption) and bone formation, favoring resorption and slowing new bone formation.

Today, it is recognized that people with chronic inflammatory conditions generally have weaker, less well-mineralized bones than healthy adults of the same age—a clear-cut demonstration of the role of inflammation in bone health.

Vitamin D works in multiple ways to rein in the immune system’s excessive inflammatory responses. This makes it clear that vitamin D provides far more comprehensive bone support than simply enhancing calcium absorption.

These findings reveal vitamin D to be a modulator of inflammation as a means of preserving bone strength.

It opens the door to other important roles for vitamin D.

**Vitamin D and Metabolic Changes**

Vitamin D is a hormone that has specific receptors that trigger structural, functional, and metabolic changes throughout the body. It is vitamin D’s role as a steroid-like hormone that triggered research that brings together the impact of inflammation on both bone and metabolic health.

This research pointed out previous studies that showed vitamin D’s multiple actions on blood sugar and other metabolic factors. These studies show that vitamin D deficiency is implicated in a low-grade, chronic inflammatory state associated with insulin resistance, metabolic syndrome, and the risk of developing type II diabetes.

Even in nondiabetics, lower vitamin D levels correlate with poorer insulin responsiveness, meaning less control over blood sugar. Low plasma vitamin D levels are also closely correlated with higher body mass index (BMI), fat mass, and waist circumference.

But correlation between nutrient status and health status does not prove a cause-and-effect relationship. Clinical trials are required to establish that kind of connection—and that’s exactly what we’ll examine next.

**Vitamin D’s Role in Blood-Sugar Control**

Studies have repeatedly shown that when animals are vitamin D deficient, supplementation with the vitamin reduces inflammation and improves insulin sensitivity.

Human studies have also shown that vitamin D supplementation is effective at managing blood sugar and other metabolic abnormalities—especially in people with low vitamin D levels.

In type II diabetics who were vitamin D deficient (blood levels less than 20 ng/mL), taking 1,000 IU/day of vitamin D3 led to improvements in endothelial function, improved measures of glucose-related protein damage (glycation), as well as in other markers of blood-vessel health.

Proper dosing is especially important. For example, studies using just 400 or 800 IU/day of vitamin D3 showed neither a reduction in diabetes incidence nor any change in blood-sugar levels, whereas in subjects with low baseline vitamin D levels, higher doses of vitamin D proved highly effective.

In a study of subjects with low vitamin D3, providing 4,000 IU/day of D3 led to significant improvements in insulin sensitivity and favorable reductions in fasting insulin levels.
Multiple other mechanisms by which vitamin D stimulates the transfer of sugar from blood into cells are gradually coming to light, including complex interactions with other hormone systems. It even appears to directly stimulate the pancreas to release insulin.1

Studies in these populations now show that supplementing with vitamin D3 daily slowed the rise in fasting blood sugar over time, improved pancreatic insulin secretion, and boosted insulin sensitivity.13,14

Additional Mechanisms of Action

Vitamin D also has a direct impact on insulin sensitivity and resistance independent of its anti-inflammatory effect.1 Studies show that vitamin D triggers increased insulin sensitivity and lowers blood sugar by at least three complementary mechanisms:

• Interactions with vitamin D receptors on skeletal muscle, where it may help to trigger maturation of developing glucose-hungry muscle cells.15

• Increased expression of insulin receptors on cells throughout the body. Those receptors in turn promote glucose transport from blood into cells.1

• Activation of a molecular complex called PPAR-delta, which regulates genes involved in burning sugar and fat for energy.1
Summary

Vitamin D arrived on the medical scene more than a century ago, and was largely viewed as the “calcium and bone vitamin.”

Recent studies show that such a view overly simplifies both bone health and vitamin D’s roles in the human body.

We now recognize that osteoporosis is an inflammatory disorder as much as it is a calcium-related disorder. We also now understand that vitamin D’s anti-inflammatory actions contribute as much to its anti-osteoporosis actions as its calcium-promoting properties.

Finally, the anti-inflammatory actions of vitamin D cross over from improving bone to maintaining healthy metabolic status by supporting normal insulin action and suppressing elevated blood sugar.

The human body is a miracle of interacting systems with unexpected relationships. Our new knowledge about vitamin D further highlights these surprising connections, and amplifies the case for maintaining ample vitamin D levels as we age.

For vitamin D, the typical dose range is 3,000 IU to 8,000 IU daily, taken with a meal for better absorption.

Annual blood tests can enable one to know if they are taking the proper dose of vitamin D they need to achieve optimal levels.

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

Vitamin D and Inflammation

Vitamin D was once thought of primarily for its role in bone health by promoting calcium absorption. More recently, it has been found to play an unexpected but important role in modulating immunity and inflammation.¹

This property reveals two important facts:

1. Vitamin D is doubly important in osteoporosis, since we now know that inflammation plays a role in the bone condition.

2. It highlights vitamin D’s value as an essential actor in maintaining body-wide metabolic health.

Studies show that vitamin D suppresses the inflammation generated by fat tissue.

Under the influence of vitamin D, immune cells increase their production of anti-inflammatory cytokines, while reducing levels of pro-inflammatory cytokines.¹ Vitamin D has similar effects on cells called lymphocytes that are involved in regulating immune responses: It shifts their profile from an inflammation-promoting to an inflammation-suppressing one.

Vitamin D acts on immune system cell receptors, where binding to the vitamin triggers regulation of more than 1,000 genes.¹ These gene-regulatory properties likely account for vitamin D’s favorable effects on emerging cancer cells.

Inflammation is considered the “final common pathway” for numerous age-related disorders. The discovery of vitamin D’s anti-inflammatory actions means we can expect to see more studies widening the applications of vitamin D beyond preventing osteoporosis and diabetes, to its role in other chronic, inflammation-driven conditions that shorten lifespan and promote disease.
References


Bone Restore with Vitamin K2 combines skeletal-strengthening nutrients in one highly-absorbable formula.

Note: Those taking the anticoagulant drug Coumadin® (warfarin) should use BONE RESTORE without vitamin K2.

Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. patent #5,962,049. DimaCal® and TRAACS® are registered trademarks of Albion Laboratories, Inc. Malate is covered by U.S. patent 6,706,904 and patents pending.

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“D”-fend Your Health

VITAMIN D3
Systemic Support for Youthful Cell Function, bone health, and supporting normal insulin and blood-sugar levels.

For full product description and to order Vitamin D3, call 1-800-544-4440 or visit www.LifeExtension.com

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.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
The Super Longevity Network (SLN), a new on-demand online channel, is your source for a wide variety of entertaining and educational content that will inform and inspire you.

SLN will include:

**Mini-Documentaries**

Featuring the leaders of the super longevity movement, with excerpts from their RAADfest presentations, plus additional interviews and personal background information.

**Latest news on super longevity**

Everything from new therapies and human trials available, to laboratory breakthroughs and FDA approvals. How about a news show where the news is actually good for a change?

**Medicine and Mindset**

Bringing together psychology and technology to help you flourish within a longer lifespan.

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On how to do everything you can to stay alive today, have fun, prosper and look good doing it.

Stay at the cutting edge of all the action, and help expand our community and increase public support for radical life extension.

Check out sample content at www.SuperLongevityNetwork.com

The network will be accessed via the internet from your phone, computer, smart TV or you can access it with a Roku device or Google Chromecast, the same way you access Netflix, Hulu or Amazon Prime content.

Use the Coupon Code LEVIP to receive your Life Extension Discount.
Milk thistle extract—rich in silymarin—is powerful weapon to support liver health. Scientific studies demonstrate silymarin’s ability to provide potent protection for your liver.¹ ²

Life Extension™’s European Milk Thistle contains standardized, top-grade potencies of silymarin, silybin, isosilybin A, and isosilybin B, providing a full spectrum of liver-supportive compounds. This unique formula includes phosphatidylcholine, a nutrient that promotes better absorption of milk thistle extract.³

The silymarin contained in European Milk Thistle is absorbed nearly 5 times better than silymarin alone, and its bioavailability to the liver is 10 times better.

**European Milk Thistle**
**Advanced Phospholipid Delivery**
Item #01922 - 60 Softgels

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The skin around the eyes is up to 10 times thinner and more delicate,¹ making it vulnerable to the effects of sun exposure, air pollutants, and protein cross links (glycation).²⁻⁵

These destructive factors lead to crow’s feet, dark circles, and puffiness around the eyes.⁶⁻⁷

Application of a topical blend of cucumber extract and collagen-stimulating peptides can repair, soothe, and protect the skin around the eyes for a refreshed appearance.
Cucumber Extract

Hearing the words “spa treatment” evokes the image of a person with cucumber slices on her eyes. This go-to treatment for rejuvenating aging skin is based on cucumber’s healing properties.\(^8\)

Cucumbers have a soothing effect and reduce skin swelling.\(^6\) They also contain free-radical scavengers like caffeic acid, vitamin E, and vitamin C that reduce skin irritation and protect against UV-induced damage.\(^9,10\)

*In-vitro* research shows that cucumber extract reduces activity of enzymes that break down *hyaluronic acid*, the skin’s natural moisturizer, along with elastin that gives skin suppleness and flexibility.\(^11\)

Clinical studies indicate that cucumber extract decreases skin irritation, excess pigmentation and wrinkling, while improving overall moisture and elasticity.\(^9\)

Collagen-Stimulating Peptides

The formation of wrinkles (crow’s feet) and fine lines around the eyes are indicators of an aging *dermal matrix*—the structural framework responsible for skin renewal and vitality.\(^13,14\)

The main component of the dermal matrix is *collagen*, in particular type I collagen, which forms mesh fibers responsible for skin’s strength and resiliency.\(^14\)

When we are young, collagen synthesis and breakdown are balanced to ensure skin remains vibrant and youthful-looking.

But as we age, oxidative stress generated from sun exposure, air pollutants, and glycation produce destructive structural changes that favor collagen degradation.\(^5,15,16\) As the skin around the eyes becomes thinner, the appearance of wrinkles and fine lines takes shape.

Scientists have found that two peptides work synergistically to restore normal collagen metabolism:\(^17\)

- **Palmitoyl Oligopeptide** signals skin fibroblasts to increase collagen production.
- **Palmitoyl Tetrapeptide-7** prevents collagen degradation by reducing inflammatory mediators including interleukin-6.

An *in-vitro* study found that these two *peptides*:

- Increase type I collagen synthesis by **258%**.
- Increase hyaluronic acid by **164%**.
- Increase fibronectin by **179%**.\(^18\)

These findings translate into anti-wrinkling effects in humans.

**Human Study of Topical Peptides**

In a two-month study involving 24 participants, twice-daily application to the crow’s feet of a topical cream containing these two *peptides* showed the following improvements compared to a placebo:\(^18\)

- Area occupied by deep wrinkles **decreased** by **39.4%**.
- Wrinkle density **decreased** by **32.6%**.
- Roughness **decreased** by **16%**.
- Complexity **decreased** by **15.7%**.
- Main wrinkle depth **decreased** by **19.9%**.
- Main wrinkle volume **decreased** by **23.3%**.
Vitamin E

Topical application of vitamin E has been shown to penetrate the skin where it protects against UV-induced DNA damage\textsuperscript{19} and reduces the inflammatory response after exposure to UV rays.\textsuperscript{20}

Vitamin E also helps improve the ability of aging skin around the eyes to retain water, leaving it smooth and supple.\textsuperscript{21,22}

Vitamin A

Vitamin A (retinol) induces beneficial changes in the epidermis and dermis to reverse the clinical signs of sun-exposed skin, including wrinkles, hyperpigmentation, and rough texture.\textsuperscript{23,24}

Studies show that when applied topically, vitamin A inhibits the activation of \textit{signaling} pathways responsible for increasing collagen-degrading enzymes.\textsuperscript{25}

In a double-blind, randomized trial involving 62 participants, topical application of retinol for 52 weeks reduced crow's feet by \textbf{44\%} and mottled pigmentation by \textbf{84\%}.

These visible improvements were accompanied by significant increases in type I procollagen—a precursor to collagen synthesis—and hyaluronic acid.\textsuperscript{26}
Summary

Most people’s skin-care regimens fail to take into account that the **skin around the eyes** is far thinner and more delicate than the rest of the skin on their face. This sets the stage for destructive attacks by external and internal factors.

Research shows that topical **cucumber extract**, collagen-stimulating **peptides**, and vitamins A and E nourish, hydrate, and rejuvenate the delicate eye area to diminish the appearance of crow’s feet, dark circles, and puffiness.

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Gary Goldfaden, MD, is a clinical dermatologist and lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology in Hollywood, FL, and Cosmesis Skin Care. Dr. Goldfaden is a member of Life Extension*’s Medical Advisory Board. All Cosmesis products are available online.

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

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References

Consumers often spend hundreds of dollars on just one pair of so-called “designer” sunglasses. Life Extension® supporters can obtain superior protection against damaging solar radiation at a fraction of the price of commercially sold sunglasses.

SolarShield® sunglasses are recognized as the number-one doctor-recommended sunglasses in the world, with more than 50 million pairs sold to date. Patented SolarShield® sunglasses with durable polycarbonate lenses and 100% UV protection fit comfortably over prescription eyewear, providing convenient protection from the harmful effects of ultraviolet radiation.

SolarShield® is a registered trademark of Dioptics, Inc.

Compare this low price to sunglasses sold in stores and see savings exceeding 90%!

For full product description and to order SolarShield® sunglasses, call 1-800-544-4440 or visit www.LifeExtension.com
Super R-Lipoic Acid is more bioavailable, stable, and potent, achieving 10-30 times higher peak blood levels. This unique sodium-R-lipoate can help you reach peak plasma concentrations within just 10-20 minutes of supplementation.

Suggested dose is one to two capsules daily.

CAUTION: If you are taking glucose-lowering medication, consult your health care provider before taking this product.

Bio-Enhanced® is a registered trademark of Geronova Research, Inc.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Eye Appeal

Take Years Off The Area Around Your Eyes

Cosmesis Cucumber Hydra Peptide Eye Cream hydrates and rejuvenates sagging skin around the delicate eye area.

Unique peptides and vitamins diminish the appearance of crow’s feet, dark circles, and puffiness under the eyes.

For full product description and to order Cosmesis Cucumber Hydra Peptide Eye Cream, call 1-800-544-4440 or visit www.LifeExtension.com

Not tested on animals.

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Item #80169 • 0.5 oz. (14 g) jar
As skin ages, it loses suppleness and smoothness. A prime reason is loss of ceramides that are required for skin to retain its moisture.

Skin Restoring Phytoceramides contains wheat-derived ceramide oils in an oral capsule that hydrate the deepest dermal layers to nourish the entire body’s skin.

### Skin Restoring Phytoceramides with Lipowheat® • Item #01596
30 liquid vegetarian capsules

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For full product description and to order Skin Restoring Phytoceramides with Lipowheat®, call 1-800-544-4440 or visit www.LifeExtension.com

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As a research scientist, ethicist, and libertarian author and activist, Dr. Mary J. Ruwart has had a long and accomplished career in various fields. But it was perhaps her position in the Upjohn Company, as a senior research scientist working on developing new therapies for diseases such as AIDS and liver cirrhosis, that gave her the greatest insight into serious problems stemming from the 1962 amendments to the Food and Drug Act.

Dr. Ruwart believes that these amendments, which are in effect to this day, have had the unintended, devastating consequence of causing millions of Americans to die prematurely.

“Regulations can have side effects that are just as deadly as drugs,” she observes.

Alarmed by this state of affairs, Dr. Ruwart was moved to write her new book, *Death by Regulation: How We Were Robbed of a Golden Age of Health and How We Can Reclaim It*.

In the book, Dr. Ruwart details how the amendments have not significantly improved drug safety or effectiveness, have been extremely detrimental to innovation, have greatly slowed the process of getting important drugs from the lab to patients, and have shifted American healthcare from inexpensive preventions to expensive treatments.
**LE:** You trace the current problems of what you call “the deadly side effects of pharmaceutical regulations” back to the 1962 Kefauver-Harris amendments to the 1938 Food and Drug Act.

**MR:** Yes. The intent of the amendments was to protect the American public. Unfortunately, new laws, like new drugs, often have deadly side effects. Behind the scenes, the 1962 amendments reshaped the pharmaceutical, nutritional, and medical industries in ways that are detrimental to our health and longevity. Because of the way they were written, the amendments continue to metastasize into these three areas today. Almost all drug-related legislation passed since then has attempted, with limited success, to correct the ever-growing problems created by the amendments. The deadly side effects of the amendments have likely cost each and every one of us many years of life.

**LE:** What exactly did the Kefauver amendments do?

**MR:** They gave the FDA the power to decide which animal-safety studies that drug companies had to do before they could test their drugs on people. The FDA could determine what human studies were necessary for it to approve a drug as “safe and effective.” Before the amendments, a drug had only needed to be shown “safe for intended use.” Once a drug company asked the FDA to approve a drug, someone at the agency had to sign off rather than simply letting six months elapse without objection.

The FDA could determine manufacturing standards for the new drug and do inspections to insure that its dictates were met. The FDA was given jurisdiction over all pharmaceutical advertising as well. In other words, the FDA was given unprecedented control over the entire drug development process in the hopes that drugs would not only be safe, but effective. Advertised accurately and manufactured carefully.

What the amendments actually did was to increase the time it takes for a new drug to move from the lab bench to the marketplace from about four years to 14 years over the next several decades. Terminally ill patients who couldn’t live with that delay had to turn to the black market in order to get access to potential cures. Every year, the costs of satisfying the FDA soared, resulting in ever-increasing prices at the pharmacy.

More than half of our potential innovations never made it to patients, as companies realized that they couldn’t recoup their investments under the new regulations. Investors began demanding a greater return as the amendments made it riskier to try to bring a drug to market.

**LE:** You argue that this has had catastrophic consequences.

**MR:** Loss of innovations and delays in the ones we do get have caused the premature death of almost half of the Americans who have died from disease since 1962. By discouraging the use of inexpensive supplements in favor of FDA-approved pharmaceuticals, the amendments shifted the healthcare paradigm in the United States from inexpensive prevention to costly treatment. The loss in lives and money from this shift is probably higher than the devastating cost of the amendment-driven reshaping of medical practice and the pharmaceutical industry, as every one of us has been adversely affected.

**LE:** This seems like it should be a major news story. Why isn’t it?

**MR:** Without insider information about how the amendments act behind the scenes, even a dedicated journalist would have a difficult time putting the story together.
In addition, most insiders have good reason to be silent. Blowing the whistle on the Kefauver amendments would make their job difficult and might even endanger the financial solvency of their company. Still, many might speak out if they thought their comments would be taken seriously instead of simply ridiculed. However, if drug companies or their employees tell the American public that the regulations meant to police the pharmaceutical industry and protect consumers often do just the opposite, their concerns are likely to be discounted. Such comments would, at best, be labeled politically incorrect, and, at worst, self-serving. Why risk your job, your company, and your good name when no one is likely to believe you anyway?

LE: Why does the FDA drug-approval process take so long?

MR: When I joined the Upjohn Company in the mid-1970s, I had no idea what was involved. Shortly after I arrived, however, I could hardly believe that any drug actually was able to jump through the maze of ever-changing regulatory hoops and make it to the marketplace.

Company chemists would make 5,000 to 10,000 potential new drugs, which were then studied in the test tube or in vitro (not in whole animals) to see if they slowed cholesterol synthesis, inhibited a particular enzyme that helped create the disease, or killed the target microbes. Drugs that looked promising might then be tested on animals to see if they worked in vivo (in whole animals) with few problematic side effects at the effective doses.

From the original batch of 5,000 to 10,000 compounds, about 250 began FDA-mandated animal-safety testing and other preclinical work. Prior to the passage of the Kefauver amendments in 1962, pharmaceutical firms, not the FDA, decided which studies were most appropriate.

Somewhere between three to six years are now consumed by the in vitro, in vivo, and preclinical regulatory and animal safety (toxicology) studies. Since there were only a few instances of too little preclinical testing prior to passage of the amendments, it’s not clear how much benefit the extended testing provides.

LE: What will be the benefits if and when the FDA undergoes major reform?

MR: Without the Kefauver amendments to the Food, Drug and Cosmetic Act, many of the legislative band-aids that were put in place to alleviate problems caused by the amendments would no longer be necessary. User fees driven by the Prescription Drug User Fee Act would be lower or nonexistent, since FDA certification wouldn’t be necessary for marketing. The seven-year monopoly that drug companies receive for orphan drug status would no longer be available, since there would be no more approvals. Because development costs would be lower without the amendments, fewer drugs would be orphans—many more would be able to recover the less intensive development costs. The Waxman Restoration Act wouldn’t add to the patent life of drugs since clinical development times would plummet.

Instead of doing large human trials to get statistically significant results, drug companies would focus on smaller trials designed to determine which patients respond best to their potential new product. This will allow companies to target their product to those who will actually benefit. Because patients will be taking fewer drugs that might help them, the incidence of drug-drug interactions will go down. Deaths from “properly prescribed medications,” which now
rank close to the fifth largest cause of death, should go down too. Although the technology to determine who will benefit most from a particular drug is often available, pharmaceutical firms must focus instead on the outdated studies demanded by the FDA.

People who fear that earlier access might mean less safety could elect to only take drugs that have FDA certification, even though drugs could be marketed without it. Patients who want earlier access could also have it. Everyone could choose for themselves. That is the freedom upon which our country was founded.

**LE:** What other benefits might result without the amendments?

**MR:** As the marketplace adjusts to the less intensive regulatory climate, we’d see more innovation, both in pharmaceuticals and nutraceuticals. Without the amendments, the FDA could not pose restrictions on what manufacturers’ representatives could say to doctors. Supplement suppliers could educate physicians on the benefits of using natural products (e.g., vitamins) instead of drugs. Pharmaceutical firms would be able to combine their drugs with CoQ10 and other nutrients to lessen side effects. Instead of being at odds, drug companies and nutraceutical firms might find it profitable to collaborate on research, marketing, or product design.

Without the FDA’s ability to dampen prevention through the use of natural products or combine them with pharmaceuticals to lessen side effects, physicians would likely become more knowledgeable about prevention. This will help the American public become healthier as well.

Since about two-thirds of the American populace is currently overweight, drug companies needn’t worry that they will run out of people who will need treatment. Unfortunately, many people won’t take the initiative to eat less, exercise more, or do other things to promote their well-being, even after being diagnosed with diabetes, cardiovascular disease, and other lifestyle-dependent maladies. Many will continue to prefer drugs to lifestyle changes or will find that we don’t know enough about prevention to control their disease without drugs.

**LE:** What would be the implications for stem-cell therapies?

**MR:** Without the FDA able to treat stem-cell products as drugs that need to go through an intensive development program before those in need can benefit, stem-cell research will return to the United States, making it much more affordable. Individual physicians will no longer have to worry about being continuously hauled into court simply because they have not checked all the regulatory boxes required by a bureaucratic development plan. Parents will not have to beg the agency to allow their children to try new treatments that might save their lives or keep them out of wheelchairs.

In short, we will once again be poised at a golden gateway of medical innovation as we were in the early 1960s. However, this time we will have better science, more know-how, and a better understanding of what spurs innovation and what squelches it.

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

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⁵. Mol Carcinog. 2012 Mar;51(3):244-56.

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This winter, a group of the world’s leading stem-cell researchers, ethicists, and visionaries gathered in Miami to talk about a change that could disrupt human life as profoundly as the invention of the combustion engine, antibiotics, or the personal computer. The event was the World Stem Cell Summit, and the group assembled included luminaries such as Life Extension® advisory board member Dr. Aubrey de Grey and researchers representing top universities, national health agencies, and industry.

In this exclusive interview with Life Extension, Bernard Siegel, founder of the World Stem Cell Summit and executive director of the Regenerative Medicine Foundation, shares some findings from the Summit and explains how the early controversy over stem-cell research actually helped fuel the revolution.

**LE:** Thank you for joining us today. One of the remarkable things about the World Stem Cell Summit is the range of experts you attract from all over the world. Many of these experts believe that stem-cell research will one day be instrumental in defeating diseases that are common today and even in extending human lifespan. Where is stem-cell technology today, and where do you think we’re heading?

**BS:** When I got involved in stem-cell research in 2002, it was all about embryonic stem cells. Embryonic stem cells were perceived as a potential cure for every disease, and the idea that they could be transformed into any cell in the human body was viewed as an elixir. When Dr. Michael West, who founded the revolutionary company Geron (and was the first scientist to isolate human embryonic stem cells for regenerative medicine), first saw embryonic stem cells, he thought it was like nuclear fusion. But it was all very controversial at the time, with some groups of people very opposed
to their use, and it attracted a lot of attention. There was a very contentious debate over their use. Looking back, I think that public debate was very important to where we are today. It created a giant demand among the public for these kinds of therapies. What came out of that controversy was a consumer movement where individuals saw stem cells as a potential cure for themselves, their family, and friends. That background is very important to understanding where we are today. Now we’re not just talking about embryonic stem cells, but about the convergence of multiple technologies into a new field called regenerative medicine.

LE: What technologies do you mean?

BS: We’re living on the cusp of a scientific and biomedical revolution that will change our lives, our children’s lives and medicine. But the public hasn’t really picked up on it yet. Society isn’t really ready for this. It’s the convergence of technologies beyond stem-cell research, like robotics, nanotechnology, big data. They’ve all exploded onto the scene at the same time. When I started this conference, we weren’t able to reprogram cells. Now we can take a stem cell derived from bone marrow and reprogram it to an embryonic state. We have genetic engineering tools that allow us to snip out parts of the gene and reprogram it. The implications are astonishing, and not just for diseases. Aging will also be affected. The human life is going to extend.

LE: It’s true that human lifespan increased dramatically over the last century, but the rate of increase has slowed, and in very recent years, has even regressed. When do you think we’ll start to see the practical effects of this technological revolution?

BS: Some of these technologies are already in the here and now. If you have access to healthcare and you live in the United States, you might already be lucky enough to have an extended lifespan. But in terms of major advances, I think it’s hard to predict right now what the breakthrough will look like and when it will come. A black swan event is an unpredictable event, so it’s very hard to know when we will have a black swan event. But I can confidently predict we will have one, and it will have a good effect. Imagine if we find a cure for something like diabetes…it’ll stun the world.

LE: What are some of the disease targets researchers are going after?

BS: You can go into any disease and find folks who are interested in attacking that disease. Cell regeneration has emerged as a major focus. We had sessions on immunotherapies for cancer. And you can’t underestimate the potential for CRISPR technology to snip out bad code from the DNA and insert good code. What if we could cure genetic diseases in the embryo stage? I’m talking about diseases like Tay-Sachs. Tinkering with the human genome could change the way our species evolves.

LE: It makes sense that diseases based on simpler genetic defects would be the first targets, but what about the most costly and complicated diseases like Alzheimer’s and heart disease? Genetics play a role there, but there’s much more involved in the disease process.

BS: That’s very true, and heart disease in particular is a challenging one. The father of mesenchymal stem cells (which are derived from various tissues in the adult and can differentiate into different types of cells) is here from Case Western University. There’s an excellent clinical trial at the University of Miami using mesenchymal stem cells to help victims of cardiac disease. We’re seeing incredible
about the World Stem Cell Summit

The World Stem Cell Summit was launched in 2003 by the nonprofit Regenerative Medicine Foundation, where Bernard Siegel is a founder and director. The goal of the summit is to bring together leaders in the field of regenerative medicine, including research scientists, ethicists, representatives from government and industry, businesses, and sources of funding.

The 2018 program featured speakers from every corner of regenerative medicine, with breakouts on immunotherapy, government oversight and regulation, tissue engineering, investment patterns, and other areas of focus that can help push the field of regenerative medicine forward.

For more information on the Regenerative Medicine Foundation, visit https://www.regmedfoundation.org
For more information on the World Stem Cell Summit, visit http://www.worldstemcellsummit.com

A native of Richmond, Virginia, Dr. Bernard Siegel founded the Genetics Policy Institute (now the Regenerative Medicine Foundation). He is committed to advocacy work on behalf of patients, doctors, and researchers in the regenerative medicine community. He is a recognized policy expert on stem-cell research, regenerative medicine and cloning.

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.
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Bill Falloon
Results from human rejuvenation studies and sequential order for implementing systemic age-reversal.

Liz Parrish
Update on gene therapy being studied to turn back the clock of cellular aging.

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The artichoke is a type of thistle—a part of the daisy family—that originates in the Mediterranean area. It has been cultivated as an edible vegetable for nearly 2,000 years, and perhaps longer.

The portion of the artichoke that we eat consists of flower buds that haven’t yet bloomed and the heart, from which the buds spring.

Artichokes aren’t common in Asia, but are often found in the cuisine of the Middle East, Europe, and the U.S. They also have some noteworthy health benefits.

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For those troubled by intestinal problems such as gas, bloating, diarrhea, or constipation, it is often difficult to determine the exact cause and proper treatment.

But now, as explained by Dr. Shanti Albani, there is an innovative home breath test that will help determine if the cause relates to bacterial overgrowth in the small intestines. The results may provide helpful answers to you and your physician.

LE: Many people suffer from intestinal ailments but have not been able to identify the cause of their symptoms. Now Life Extension® is offering a test that holds promise for those who suffer from chronic intestinal complaints, correct?

SA: That’s true. We recently introduced a home test that looks for a common, but underappreciated problem called small intestinal bacterial overgrowth (SIBO).

SIBO is thought to be the underlying cause in at least 60% of irritable bowel syndrome (IBS) cases, and it is also suspected when people have chronic symptoms of gas, bloating, and intestinal discomfort, even without a diagnosis of IBS.

What excites me about this test is that once SIBO is identified, specific suggestions are available that can help support and improve microbial balance in the intestinal tract. Such an approach affords more relief than therapies designed only to manage intestinal discomfort without a lasting solution.
LE: Can you tell us more about what SIBO (small intestinal bacterial overgrowth) is?

SA: For optimum health, we should have a diverse and sizable population of bacteria in our large intestine, and comparatively fewer bacteria in our small intestine. In fact, the bacterial population in our gut increases as we move through the small intestine toward the colon, but it is in the colon where the microbial populations expand exponentially. In the case of SIBO, bacteria that may be considered normal in the colon can populate and overgrow in the small intestine. This overgrowth causes gas, bloating, cramping, and even systemic symptoms such as brain fog and acne. The underlying cause of SIBO is almost always a loss of normal intestinal motility.

LE: By “loss of intestinal motility,” do you mean constipation, or can people who have loose stools also have SIBO?

SA: Both people with constipation and those with diarrhea can have SIBO. There are two main types of movement within the intestine: peristalsis and the migrating motor complex (MMC). Peristalsis occurs during digestion and moves large food masses through the digestive tract. MMC occurs during the fasting state and sweeps residual undigested material and bacteria from the small intestine into the colon. So peristalsis is the primary mover of meals through the system and the MMC provides the small intestines with an important between-meal house-cleaning.

Underactive peristalsis is often associated with constipation and overactive is associated with diarrhea, but a faulty MMC is the main underlying cause of SIBO. When the MMC is not working properly, bacteria are not swept out of the small intestine and into the colon, thus they can grow and overpopulate in the small intestine. As the movements produced by peristalsis and the migrating motor complex are distinct, a compromised MMC and SIBO can occur in the presence of either diarrhea or constipation. If you ever hear your stomach growling between meals, that is your MMC doing its job of moving excess bacteria and debris into the colon!

LE: Sounds like the migrating motor complex is like the street sweeper of the intestines! What could cause it to stop working?

SA: That is a great question. One thing we do know is that if you ever had food poisoning, your chances of developing SIBO are much higher. Other conditions that damage the nerves in the intestines, or interfere with motility can also cause SIBO. For example, hypothyroid, previous abdominal surgeries, use of opioid medications, poor eating habits, diabetes or even constant eating, since the migratory motor complex only functions between meals.

LE: You mentioned gas and bloating as key symptoms of SIBO, what else should someone look for?

SA: While gas, bloating, diarrhea, and/or constipation are hallmarks of SIBO, there are other clues to consider:

• Gut symptoms will sometimes temporarily improve with antibiotics as bacteria in the small intestine are eliminated.
• Gut symptoms are sometimes worse with fiber because the bacteria in the small intestine use the fiber as a food source and multiply.
• Individuals with SIBO may have nutritional deficiencies, as the many bacteria in the small intestine interfere with absorption and use much-needed nutrients for their own propagation.
The health of our gut impacts the health of the rest of our body. Those with SIBO frequently suffer from acne, rosacea, depression, fatigue, fibromyalgia, and/or joint pain.

This is a condition with an extensive impact on health. I am excited to get the word out because identifying SIBO can make a huge difference in quality of life for many people.

LE: How is it possible for these bacteria to cause so many symptoms?

SA: When we eat carbohydrates and fiber, we should break down the carbs into sugar and absorb them for energy production. The fiber should pass into the colon where it feeds colonic bacteria and helps form the stool. When too many bacteria make their home in the small intestine, they steal our food, fermenting the carbohydrates and fiber we eat into large amounts of hydrogen and methane gas.

LE: So, that is what causes the gas, bloating, diarrhea, and constipation?

SA: Yes, hydrogen gas tends to activate peristalsis and cause diarrhea, while methane gas slows it down and is more associated with constipation. In addition, the bacteria themselves can be irritating to the intestines resulting in inflammation, altered immune response, leaky gut, and some of the body-wide symptoms we discussed earlier.

LE: I can see the importance of testing for SIBO! How does the test work?

SA: The SIBO test is a breath test. We mentioned that the bacteria in the small intestine can produce large amounts of hydrogen and methane gas. This gas is actually absorbed from the intestines into the bloodstream and then exhaled through the lungs. The SIBO test comes as a kit that is completed at home. The subject drinks a solution containing either the sugar lactulose or glucose and then collects breath samples in tubes as the solution moves through the intestine. It takes about 90-120 minutes for the sugar solution to move from the mouth to the colon. If significant amounts of hydrogen or methane gas are detected in the breath during that time, it strongly suggests that excessive bacteria in the small intestine are producing gas from the sugar and the person likely has SIBO.

LE: You mentioned that you can use either a lactulose or glucose solution for the test. Which one is better?

SA: First off, I want to avoid any confusion by pointing out that lactulose is distinct from lactose, the sugar found in milk and dairy. That being said, between the lactulose and the glucose, the lactulose solution has a distinct advantage. It turns out that humans cannot digest or absorb lactulose, only bacteria can use it. Since it is not absorbed, lactulose travels the full length of the small intestine revealing SIBO throughout its entirety, including the lower end of the small intestine where it most commonly occurs.

Although glucose is highly fermentable, it is absorbed in the upper portion of the small intestines, so, if SIBO exists in the lower
portion of the small intestines, it may be missed. We suggest starting with the lactulose SIBO test. If the test is negative and SIBO is still suspected, you can follow-up with a glucose SIBO test.

**LE:** Is this test something I can get through my doctor?

**SA:** Although the existence and clinical significance of SIBO has been well-established in the medical literature, unfortunately, it can take some time before this knowledge percolates into the way doctors practice medicine. So, although some forward-thinking doctors and gastroenterologists may offer SIBO testing, most doctors are still undereducated on the importance of SIBO and how to test for it. Naturopathic doctors are more likely to offer the testing, as well as holistic medical doctors.

**LE:** If someone suspects they have SIBO, is it safe to take probiotics like lactobacillus and bifidobacterium, or could these bacteria populate the small intestines and make things worse?

**SA:** Enough evidence has accumulated to say that multiple strains of bifidobacterium and lactobacillus may decrease symptoms and improve breath tests in individuals with SIBO. It is thought that probiotics can inhibit the growth of less beneficial bacteria, favorably modulate the immune system and help with intestinal motility. Taking all of this into consideration, a high-quality multistrain probiotic can be a valuable part of SIBO treatment and management.

**LE:** If someone does test positive for SIBO, what is the next step?

**SA:** Addressing SIBO is multifaceted and includes dietary changes, antibiotics or antimicrobial herbs, and agents to support intestinal motility. It is best to find a doctor who specializes in SIBO, but customers can also call in and speak with Life Extension’s specially trained Wellness Specialists who can assist them with finding a physician, provide helpful information and provide customized suggestions that they can discuss with their own doctor.

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

Dr. Shanti Albani obtained her medical degree in Naturopathic Medicine in 2003 from the National University of Natural Medicine in Portland, Oregon. She practiced medicine for many years in central Mexico specializing in gastrointestinal disorders and hormone balance. During this time, she also owned a nutrition store and taught courses in bioidentical hormone replacement therapy for physicians. She has worked at Life Extension since 2010 and is currently the Manager of Clinical Information.
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1-2-3 EASY
How it works:

1. ORDER
   Call 1-800-208-3444 toll-free or visit LifeExtension.com/LabServices.

2. DRAW
   For blood tests, take your form to a local lab. Collect at home for saliva, breath, etc.

3. REVIEW
   Go over results for free with our Wellness Specialists by calling 1-800-226-2370. You may wish to review them with your doctor as well.

WHAT’S NEW FOR 2018

PATHWAY FIT® DNA WEIGHT MANAGEMENT** (LC100067)
$398.66 $224.25
Your DNA holds the blueprint to how your body responds to both food and exercise.

PAIN MEDICATION DNA INSIGHT® PROFILE ** (LC100069)
$398.66 $224.25
This profile helps you understand your body’s likely response to pain relief for 13 commonly prescribed pain medications.

MENTAL HEALTH DNA INSIGHT® PROFILE** (LC100068)
$398.66 $224.25
The Mental Health Profile helps you understand your body’s likely response to 50+ psychiatric medications.

DNA GENETIC CANCER RISK PROFILE** (LC100057)
$398.66 $224.25
With only a saliva sample, you can identify your risk for 25 hereditary cancers by analyzing 98 genes from your DNA including the well-known BRCA1, BRCA2, TP53, and APC. Not available in NY.

APOE GENETIC TEST FOR ALZHEIMER’S AND CARDIAC RISK** (LC100059)
$198.66 $111.75
Apolipoprotein E (ApoE) is an important regulator of cholesterol and triglyceride levels in your blood and supports lipid transport and injury repair in your brain. Genetically, E4 is the strongest risk factor for developing Late Onset Alzheimer’s disease. According to the National Institute of Health, inheriting a single copy of ApoE4 increases the risk of Alzheimer’s disease by about three-fold. Inheriting two copies increases the risk by about 12-fold. In fact, almost 40% of AD patients have inherited an E4 allele.

SIBO HOME BREATH KIT (LACTULOSE)** (LC100063)
$332 $186.75
SIBO stands for small intestinal bacterial overgrowth. This condition occurs when certain bacterial populations proliferate too much in the small intestine. Healthy strains of bacteria are beneficial, but when unhealthy strains grow and expand too much, it leads to problems like gas, bloating, abdominal pain/distention, cramping, brain fog, and more. Research shows that up to 70% or more of those diagnosed with IBS have SIBO.

NEUROTRANSMITTER PANEL** (LC100058)
$265.33 $149.25
Serotonin, Dopamine, Epinephrine, Norepinephrine, GABA, Glutamate, Glycine, Histamine and PEA. Alterations in these nine neurotransmitters play a significant role in contributing to symptoms such as cognitive disorders, depression, anxiety, diminished drive, fatigue and sleep difficulties, craving, addictions, pain and more. Not available in NY.

TOXIC METALS PANEL (Fecal)** (LC100076)
$226.66 $127.50
The results of fecal elemental analysis can help you identify and eliminate dietary exposure to toxic metals, while also assessing the body’s natural excretion of metals. The panel tests Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Copper, Lead, Mercury, Nickel, Platinum, Thallium, Tungsten, and Uranium.

OMEGA-3 INDEX COMPLETE** (LC100066)
$132 $74.25
Beneficial for everyone! People not taking omega-3/fish oil should check their baseline omega-3 index to see if it is in the desirable or concerning range. Those taking omega-3/fish oil supplements should take the test to see if they need to adjust their dosage. You want to target a range of 8%–12% for your omega-3 index score.

For Our Local Customers:
For those residing in the Ft. Lauderdale, Florida, area, blood-draws are also performed at the Life Extension Nutrition Center from 9:00 am to 2:00 pm Monday through Saturday. Simply purchase the blood test and have it drawn with no wait! Our address is:
5990 NORTH FEDERAL HIGHWAY, FT. LAUDERDALE, FL, 33308–2633
**ANNUAL LAB TEST PANELS**

### WHOLE BODY HEALTH

<table>
<thead>
<tr>
<th>Panel Name</th>
<th>RETAIL PRICE</th>
<th>SUPER SALE PRICE</th>
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<tbody>
<tr>
<td>MALE LIFE EXTENSION PANEL ENHANCED (LC322582)</td>
<td>$400</td>
<td>$199</td>
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<tr>
<td>CBC/Chemistry Profile • DHEA-S • PSA (prostate-specific antigen) Homocysteine • C-Reactive Protein (high-sensitivity) • ApoB • Free Testosterone • Total Testosterone • Estradiol • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c</td>
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<tr>
<td>MALE ELITE PANEL* (LC100016)</td>
<td>$766.66</td>
<td>$431.25</td>
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<tr>
<td>CBC/Chemistry Profile • Free and Total Testosterone Total Estrogens • Estradiol • DHEA-S • Progesterone • Pregnenolone DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • Free and Total PSA IGF-1 • SHBG • Vitamin D 25-OH • hs-CRP • Ferritin • Homocysteine Insulin • Hemoglobin A1c ApoB</td>
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<tr>
<td>MALE COMPREHENSIVE HORMONE PANEL* (LC100010)</td>
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<td>CBC/Chemistry Profile • DHEA-S, Estradiol • DHT • PSA Pregnenolone • Total and Free Testosterone • SHBG • TSH • Free T3</td>
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<tr>
<td>MALE BASIC HORMONE PANEL (LC100012)</td>
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<td>DHEA-S • Estradiol • Total and Free Testosterone • PSA</td>
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<tr>
<td>INSULIN FASTING (LC004333)</td>
<td>$39.87</td>
<td>$24.42</td>
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<td>Helpful to assess insulin resistance.</td>
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<tr>
<td>NMR LIPOPROFILE* (LC123810)</td>
<td>$132</td>
<td>$74.25</td>
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<tr>
<td>The NMR Lipoprofile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.</td>
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<td>ADVANCED OXIDIZED LDL PANEL* (LC100035)</td>
<td>$380</td>
<td>$213.75</td>
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<td>This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase and Oxidized LDL.</td>
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<tr>
<td>FEMALE LIFE EXTENSION PANEL ENHANCED (LC322535)</td>
<td>$400</td>
<td>$199</td>
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<tr>
<td>CBC/Chemistry Profile • DHEA-S • Estradiol • Homocysteine ApoB • C-Reactive Protein (high-sensitivity) • Progesterone Free Testosterone • Total Testosterone • TSH for thyroid function Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c</td>
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<tr>
<td>FEMALE ELITE PANEL* (LC100017)</td>
<td>$766.66</td>
<td>$431.25</td>
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<tr>
<td>CBC/Chemistry Profile • Free and total Testosterone Total Estrogens • Estradiol • Estrone • DHEA-S • Progesterone Pregnenolone • DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 IGF-1 • SHBG • Vitamin D 25-OH • hs-CRP • Ferritin • Homocysteine Insulin • Hemoglobin A1c ApoB</td>
<td></td>
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<tr>
<td>FEMALE COMPREHENSIVE HORMONE PANEL* (LC100011)</td>
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<td>$224.25</td>
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<tr>
<td>CBC/Chemistry Profile • DHEA-S, Estradiol • Total Estrogens TSH • Free T3 • Progesterone • Pregnenolone • Total and Free Testosterone • SHBG</td>
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<tr>
<td>FEMALE BASIC HORMONE PANEL (LC100013)</td>
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<tr>
<td>DHEA-S • Estradiol • Total and Free Testosterone • Progesterone</td>
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### WHAT’S INCLUDED IN THE CBC/CHEMISTRY PROFILE

Many of these panels include a CBC/Chemistry Profile that evaluates:

- **CARDIOVASCULAR RISK**
  - Total Cholesterol • HDL Cholesterol • LDL Cholesterol • Triglycerides
  - Cholesterol/HDL Ratio • Estimated CHD Risk • Glucose

- **LIVER FUNCTION**
  - AST (SGOT) • ALT (SGPT) • LDH • Total Bilirubin • Alkaline phosphatase

- **KIDNEY FUNCTION**
  - BUN • Creatinine • BUN/Creatinine Ratio • Uric Acid

- **BLOOD PROTEINS**
  - Total Protein • Albumin • Globulin • Albumin/Globulin Ratio

- **BLOOD COUNTS**
  - Red Blood Cell Count • White Blood Cell Count • Eosinophils Neutrophils (Absolute) • Lymphs (Absolute) • Eos (Absolute) • Baso (Absolute)
  - RDW • Monocytes (Absolute) • Monocytes • Lymphocytes • Platelet Count

- **BLOOD MINERALS**
  - Calcium • Potassium • Sodium • Chloride • Iron

The retail price for the CBC/Chemistry Profile alone is $46, but drops to $26 during the Blood Test Super Sale. (LC381822)

These CBC/Chemistry tests are included in the popular Male and Female Panels, so you don’t have to order them separately.

### ALLERGY TESTS

<table>
<thead>
<tr>
<th>Test Name</th>
<th>RETAIL PRICE</th>
<th>SUPER SALE PRICE</th>
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<tbody>
<tr>
<td>FOOD SAFE ALLERGY TEST – BASIC** (LCM73001)</td>
<td>$264</td>
<td>$148.50</td>
</tr>
<tr>
<td>This test measures delayed (IgG) food allergies for 95 common foods.</td>
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<tr>
<td>FOOD SAFE ALLERGY TEST – EXTENDED** (LCM73002)</td>
<td>$264</td>
<td>$148.50</td>
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<tr>
<td>This test measures delayed (IgG) food allergies to an additional 95 foods.</td>
<td></td>
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</tr>
<tr>
<td>FOOD SAFE ALLERGY TEST – COMBO** (LCM73003)</td>
<td>$500</td>
<td>$281.25</td>
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<tr>
<td>This test measures delayed (IgG) food allergies to all 190 foods found in our Basic and Extended panels.</td>
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</tbody>
</table>

**This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit and will incur an additional $55 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.

**This test is packaged as a kit.

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**Blood tests available in the continental United States only.

Restrictions apply in NY, NJ, RI, and MA. Not available in Maryland. Kits not available in Pennsylvania.**
**Amino Acids**
- Arginine/L-Ornithine Capsules
- Arginine Ornithine Powder
- Branched Chain Amino Acids
- D,L-Phenylalanine Capsules
- L-Arginine Caps
- L-Carnitine
- L-Glutamine
- L-Glutamine Powder
- L-Lysine
- L-Taurine Powder
- L-Tyrosine Powder
- Super Carnosine
- 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®
- Optimal BP Management
- NitroVasc with CORDIART™
- Pomegranate Complete
- Pomegranate Fruit Extract
- Triple Action Blood Pressure AM/PM
- VenoFlow™

**Bone Health**
- Bone Restore
- Bone Restore-Sugar Free
- 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
- CocoaMindy®
- 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-Eez™
- Neuro-Mag® Magnesium L-Threonate
- Optimized Ashwagandha Extract
- PS (Phosphatidylserine) Caps
- Vinpocetine

**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 w/Probiotics
- Esophaguard™
- Super Amino Acids

**Energy Management**
- Adrenal Energy Formula
- Asian Energy Boost
- D-Ribose Powder
- D-Ribose Tablets
- Forskolin
- Mitochondrial Basics with PQQ
- Mitochondrial Energy Optimizer with PQQ
- NAD+ Cell Regenerator™
- Optimized NAD+ Cell Regenerator™ with Resveratrol
- PQQ Caps
- Rhodiola Extract
- RiboGen™ French Oak Wood Extract
- Triple Action Thyroid

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

**Fish Oil & Omegas**
- OMEGA FOUNDATIONS® Cephalic EPA/DHA
- OMEGA FOUNDATIONS® Omega-3 (EPA/DHA) with Astaxanthin
- OMEGA FOUNDATIONS® Omega-3 with Sesame Lignans & Olive Extract
- OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin
- OMEGA FOUNDATIONS® Super Omega-3 Purified Omega-7
- OMEGA FOUNDATIONS® Vegetarian DHA

**Food**
- California Estate Extra Virgin Olive Oil
- Kenyan Green Tea Crystal
- Kenyan Purple Tea Crystal
- Rainbow Blend Decaf Ground Coffee
- Rainbow Blend Ground Coffee
- Rainbow Blend Ground Natural Mocha Flavor
- Rainbow Blend Natural Vanilla Flavor
- Rainbow Blend Whole Bean Coffee
- Stevia Sweetener

**Glucose Management**
- CinSulin® with InSea® and Crominex® 3+ Glycemic Guard™
- Mega Benfotiamine

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

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

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

**Inflammation Management**
- 5-LOX Inhibitor with AprèsFlex®
- Advanced Bio-Curcumin® with Ginger & Turmerones
- Black Cumin Seed Oil
- Black Cumin Seed Oil with Bio-Curcumin®
- Boswella
- Comfort Max™
- Cytokine Suppress™ with EGCG
- Serrafolin
- Specially-Coated Bromelain
- Super Bio-Curcumin®
- Zyflamend® Whole Body

**Joint Support**
- Arthro-Immune Joint Support
- ArthroMax® Advanced with UC-II® & AprèsFlex®
- ArthroMax® with Theaflavins & AprèsFlex®
- ArthroMax® Elite
- 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®
- Uric Acid Control
- Water-Soluble Pumpkin Seed Extract

**Liver Health & Detoxification**
- Anti-Alcohol with HepatoProtection Complex
- Calcium D-Glucarate
- Chlorella
- Chlorophyll
- European Milk Thistle
- Glutathione, Cysteine & C
- HepatoPro
- Liver Efficiency Formula
- N-Acetyl-L-Cysteine
- PectaSol®
- Silymarin
- SODzyme® with GliSODin® & Wolfberry

**Longevity & Wellness**
- Alpha-Lipoic Acid
- AppleWise Polyphenol Extract
- Berry Complete
- Blueberry Extract
- Blueberry Extract with Pomegranate
- DNA Protection Formula
- Enhanced Berry Complete with Acai
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<td><strong>Men's Health</strong></td>
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<td>Male Vascular Support</td>
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<td>PalmettoGuard® Saw Palmetto with Beta-Sitosterol</td>
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<td>Pomi-T®</td>
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<td>Super MiraForte with Standardized Lignans</td>
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<td>Children's Formula Life Extension Mix™</td>
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<td>Plant Protein Complete &amp; Amino Acid Complex</td>
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<td>Gamma E Mixed Tochopherol Enhanced with Sesame Lignans</td>
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<td>High Potency Optimized Folate</td>
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**Cosmesis**

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<td>ADVANCED LIGHTENING CREAM • 1 oz</td>
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<td>ANTI-REDNESS &amp; ADULT BLEMISH LOTION • 1 oz</td>
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<td>ADVANCED PEPTIDE HAND THERAPY • 4 oz</td>
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<td>ADVANCED TRIPLE PEPTIDE SERUM • 1 fl. oz</td>
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<td>CUCUMBER HYDRA PEPTIDE EYE CREAM • 5 oz</td>
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<td>ADVANCED UNDER EYE SERUM W/STEM CELLS • .33 fl oz</td>
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<td>AMBER SELF MICRODERMABRASION • 2 oz</td>
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<td>ENVIRONMENTAL SUPPORT SERUM • 1 fl. oz</td>
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<td>80158</td>
<td>ANTI-AGING FACE OIL • 1 fl. oz</td>
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<td>ESSENTIAL PLANT LIPIDS REPARATIVE SERUM • 1 fl. oz</td>
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<td>ANTI-AGING MASK • 2 oz</td>
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<td>EYE LIFT CREAM • 0.5 fl. oz</td>
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<td>FACE REJUVENATING ANTI-OXIDANT CREAM • 2 oz</td>
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<td>ANTI-AGING REJUVENATING SCALP SERUM • 2 fl. oz</td>
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<td>HEALING FORMULA ALL-IN-ONE CREAM • 1 oz</td>
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**subtotal of column 3**

**subtotal of column 4**

*Receive 25% off the retail price of all products.*
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<td><strong>01689</strong></td>
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<td><strong>30747</strong></td>
<td>DIGEST RC™ • 30 caps</td>
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<td>DIGESTIVE ENZYMES (Enhanced Super) • 60 veg. caps</td>
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<td>D. L-PHENYLALANINE • 500 mg, 100 veg. caps</td>
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<td>DMAE BITARTRATE • 150 mg, 200 veg. caps</td>
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<td>DNA PROTECTION FORMULA • 30 veg. caps</td>
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<td>DOG MIX • 100 grams powder</td>
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<td><strong>02006</strong></td>
<td>DOPA-MIND™ • 60 veg. caps</td>
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<td>DR. PROCTOR’S ADVANCED HAIR FORMULA • 2 oz</td>
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<td><strong>00320</strong></td>
<td>DR. PROCTOR’S HAIR SHAMPOO • 8 oz</td>
<td>24.95 18.71 16.50</td>
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<td><strong>01967</strong></td>
<td>ENDOTHELIAL DEFENSE™ w/POMEGRANATE COMPLETE and CARDIART™ • 60 softgels</td>
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<td>ENDOTHELIAL DEFENSE™ w/GLISODIN® • 60 veg. caps</td>
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<td>EPA/DHA (Clearly) • 120 softgels</td>
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<td>ESOPHACOOL™ • 60 chewable tablets</td>
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<td>ESOPHAGEAL GUARDIAN (Berry flavor) • 60 chewable tablets</td>
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<td><strong>01894</strong></td>
<td>ESTROGEN FOR WOMEN • 30 veg. tabs</td>
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<td>EUROPEAN LEG SOLUTION DIOSMIN 95 • 600 mg, 30 veg. tabs</td>
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<td>EXTRAORDINARY ENZYMES • 60 caps</td>
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<td>(CALIFORNIA ESTATE) EXTRA VIRGIN OLIVE OIL • 600 ml (16.9 fl oz)</td>
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<td>EYE PRESSURE SUPPORT W/MITTOGENOL® • 30 veg. caps</td>
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<td>FAST-ACTING JOINT FORMULA • 30 caps</td>
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<td>FAST-C® w/DIHYDROQUERCETIN • 120 veg. tabs</td>
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<td>FEMENNESSENCE MACAPEGASE® • 120 veg. caps</td>
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<td>FLORASSIST® GI w/PAGE TECHNOLOGY•30 liquid veg. caps</td>
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<td>FLORASSIST® ORAL HYGIENE • 30 lozenges</td>
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<td>FLORASSIST® BALANCE • 30 liquid veg. caps</td>
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<td>FLORASSIST® MOOD • 60 caps</td>
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<td>FLORASSIST® NASAL • 30 veg. caps</td>
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<td>FLORASSIST® PREBIOTIC • Natural Strawberry, 60 chewable tablets</td>
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<td>FOLATE HIGH POTENCY (Optimized) • 5,000 mcg, 30 veg. tablets</td>
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<td>FOLATE + VITAMIN B12 (Bioactive) • 90 veg. caps</td>
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<td>FORSKOLIN • 10 mg, 60 veg. caps</td>
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<td>FUCOIDAN W/MARITECH® 926 (Optimized) • 60 veg. caps</td>
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**SUBTOTAL OF COLUMN 6**

| **02670** | GAMMA E MIXED TOCOPHEROL/TOCOTRIENOLS • 60 softgels | 40.00 30.00 27.00 |
| **02075** | GAMMA E MIXED TOCOPHEROL w/ENHANCED SESAME LIGNANS • 60 softgels | 32.00 24.00 21.75 |
| **01394** | GARLIC (Optimized) • 200 veg. caps | 24.95 18.71 15.75 |
| **02100** | GASTRO-EASE™ • 60 veg. caps | 44.00 33.00 30.00 |
| **02119** | GEROPROTECT® AGELLESS CELL® • 30 softgels | 40.00 30.00 27.00 |
| **02133** | GEROPROTECT® LONGEVITY A.I.® • 30 softgels | 56.00 42.00 38.00 |
| **01122** | GINGER FORCE® • 60 liquid caps | 34.95 26.21 |
| **01658** | GINKGO BILOBA CERTIFIED EXTRACT™ 120 mg, 365 veg. caps | 50.00 37.50 33.00 |
| **00758** | GLA WITH SESAME LIGNANS (Mega) • 60 softgels | 19.50 14.63 13.50 |
| **00345** | (L)-GLUTAMINE CAPSULES • 500 mg, 100 veg. caps | 14.95 11.21 10.13 |
| **00141** | (L)-GLUTAMINE POWDER • 100 grams | 22.00 16.50 15.00 |
| **00522** | GLUCOSAMINE/CHONDROITIN CAPSULES • 100 caps | 38.00 28.80 25.40 |
| **01541** | GLUTATHIONE, CYSTEINE & C • 100 veg. caps | 22.00 16.50 15.00 |
| **02123** | GLYCERIN GUARD™ • 30 veg. caps | 42.00 31.50 28.00 |
| **01669** | GLYCYNE • 1,000 mg, 100 veg. caps | 12.00 9.00 8.10 |
| **02141** | GRAPE SEED EXTRACT W/RESVERATROL & PTEROSTILBENE 100 mg, 60 veg. caps | 36.00 27.00 25.50 |
| **01620** | GREEN COFFEE EXTRACT COFFEEGENIC® 400 mg, 90 veg. caps | 32.00 24.00 21.00 |
| **00953** | GREEN TEA EXTRACT (Mega)lightly caffeinated, 100 veg. caps | 30.00 22.50 18.00 |
| **00954** | GREEN TEA EXTRACT (Mega)decaffeinated, 100 veg. caps | 30.00 22.50 18.00 |

**SUBTOTAL OF COLUMN 6**

**TO ORDER ONLINE VISIT:** www.LifeExtension.com

**RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**
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**SUBTOTAL OF COLUMN 7**

**SUBTOTAL OF COLUMN 8**
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<td>VITAMIN C w/DIHYDROQUERCETIN 1,000 mg, 250 veg. tablets</td>
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<td>VITAMIN C POWDER (BUFFERED) • 454 grams</td>
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<td>VITAMIN C-MAGNESIUM CRYSTALS (EFFERVESCENT) 180 grams</td>
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<td>01732</td>
<td>VITAMIN D3 • 2,000 IU, 1 fl. oz, Mint flavor</td>
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<td>VITAMIN D3 • 1,000 IU, 90 softgels</td>
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<td>VITAMIN D3 • 1,000 IU, 250 softgels</td>
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<td>VITAMIN D3 • 5,000 IU, 50 softgels</td>
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<td>VITAMIN D3 • 7,000 IU, 60 softgels</td>
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<td>01758</td>
<td>VITAMIN D3 w/SEA-IODINE™ • 5,000 IU, 60 caps</td>
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<td>VITAMIN D3 LIQUID • 2,000 IU, 1 fl. oz</td>
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<td>VITAMIN D AND K w/SEA-IODINE™ • 60 caps</td>
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<td>VITAMIN E (Super) • 400 IU, 90 softgels</td>
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<td>VITAMIN K2 (Low dose) • 45 mcg, 90 softgels</td>
<td>18.00</td>
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**Books**

- **THE RIGHT TO TRY** by Darcy Olsen • 2016
- **DOCTORED: THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN** by Sandeep Jauhar • 2015
- **MISSING MICROBES** by Martin J. Blaser, MD • 2014
- **DISEASE PREVENTION AND TREATMENT, FIFTH EDITION** (Hardcover) • 2014
- **THE RESTORATION OF THE HUMAN BODY [IN 7 PARTS]** by Sergey A. Dzugan, MD, PhD • 2014
- **I'M TOO YOUNG FOR THIS** by Suzanne Somers • 2013
- **PHARMOCRACY** by William Fulton • 2011
- **YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY** by Gary Goldfaden, MD • 2012
- **KNOCKOUT** by Suzanne Somers • 2009
- **TWO'S COMPANY: FIFTY YEAR ROMANCE** by Suzanne Somers • 2017
- **THE COMPLETE MEDITERRANEAN DIET** by Michael Ozner, MD • 2014

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