OBAMA MUST RELEASE JAY KIMBALL FROM PRISON

How Drug Companies Inflict Needless Death!

Foods that Spike Deadly After-Meal Glucose Surges

Activate Signaling Pathways To Reverse Cell Aging

FDA Insider Exposes Vioxx® Scandal

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A Critical Brain Booster. . .
Magnesium is needed for more than 300 biochemical reactions in the body.²
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In pre-clinical models, magnesium L-threonate contained in Neuro-Mag™ boosted magnesium levels in spinal fluid by an impressive 15% compared to no increase with conventional magnesium.²
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**Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** contains PrimaVie® shilajit that doubles levels of CoQ10 in the mitochondria.1

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Combining ubiquinol CoQ10 with shilajit generates a powerful synergy that supports more youthful cellular energy production than CoQ10 alone.2,4

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Curcumin is the health-promoting trace compound derived from the Indian spice turmeric. But not all turmeric is alike.

The curcumin found in the vast majority of dietary supplements is derived from turmeric that is nutritionally inferior.

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In recent studies comparing the effects of standard curcumin against turmeric extracts comparable to Super Bio-Curcumin®, researchers observed:

- Nearly twice the support for immune health.
- Approximately twice the support for inflammatory issues.
- Almost double the antioxidant support.

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The graphs on this page illustrate that one 400 mg vegetarian capsule per day of Super Bio-Curcumin® supplies the equivalent of 2,500-2,800 mg of commercial curcumin supplements.

A bottle containing 60 vegetarian capsules of Super Bio-Curcumin® retails for $38. If a member buys four bottles, the price is reduced to only $26.25 per bottle.

References

CAUTION: Do not take if you have gallbladder problems or gallstones. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

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To order Super Bio-Curcumin®, call 1-800-544-4440 or visit www.LifeExtension.com

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Legal Murder

BY WILLIAM FALOON

No one knows exactly how many Americans were killed by Vioxx®.

According to Dr. David Graham, the hero who defied his corrupt FDA superiors, Vioxx® caused 88,000 to 139,000 excess cases of heart attack and stroke.1,2

This carnage occurred as Merck (the maker of Vioxx®) worked closely with high-level FDA officials to suppress data showing the lethal dangers of this once-popular arthritis drug.3,4

According to a review published in the Archives of Internal Medicine, Merck held back initial data showing Vioxx® caused an increase in heart attack and stroke risk.5 It took three more years of patients needlessly dying before Vioxx® was pulled off the market.

The FDA never mandated Vioxx® be banned. As lawsuits started piling up, Merck made a business decision to withdraw Vioxx® worldwide, while denying there was a safety issue.6
Merck Pleads Guilty To Criminal Charges

After a seven-year Justice Department investigation, Merck pled guilty to a criminal misdemeanor that it illegally promoted Vioxx® and deceived the government about the drug’s safety.7

Merck paid the federal government a $950 million fine. It has also paid over $4 billion in compensation to victims (or their family members) for the side effects Vioxx® caused, along with punitive damages for covering up the lethal dangers.7

Before it was withdrawn, Merck racked up $11 billion in Vioxx® sales.8 So with the criminal fine paid to the government and the money paid out so far to victims, Merck appears to be billions of dollars ahead financially by knowingly selling a drug that killed tens of thousands of human beings!

Egregious Cover Up

Four years before Vioxx® was withdrawn, the results from a large clinical trial were published comparing patients using naproxen or Vioxx®.

The findings showed a 500% increased risk of heart attack in Vioxx® users compared to those taking naproxen.9

This trial was designed, performed and paid for by the drug industry. The findings from this trial should have resulted in the FDA withdrawing approval of Vioxx®.

Instead, the drug industry (working in cahoots with FDA) came up with a ridiculous upside-down analysis of the data. They concluded that Vioxx® did not cause a 500% increase in heart attacks, but instead that naproxen resulted in a 500% decrease in heart attack incidence.10

Dr. David Graham is the senior epidemiologist in the FDA’s Office of Drug Safety. Dr. Graham knew that naproxen did not reduce heart attack risk by 500%. When Dr. Graham saw how data from this study was being manipulated to cover up Vioxx®’s lethal dangers, he broke rank with corrupt FDA officials.

As you’ll read in an eye-opening interview in this month’s issue, Dr. Graham’s battle to expose the lethal dangers of Vioxx® almost got him fired from the FDA.

Government Doesn’t Care About Victims

As most of you know, the intentional killing of a human is a felony, often punishable by life in prison (or worse).

In the Justice Department’s settlement with Merck, there is no discussion of murder. Instead, Merck agreed to plead guilty to FDA “regulatory” violations involving its promotion of Vioxx® to rheumatoid arthritis patients when it was approved only to treat osteoarthritis. Merck also pled guilty to misleading Medicaid officials about the safety of Vioxx®.11

Dr. David Graham estimates that Vioxx® directly killed more Americans than died during the entire Vietnam War.9

Yet no where in the criminal settlement agreement does Merck have to admit to “intentionally killing people. It appears that the Justice Department is not concerned by the human body count. The settlement only requires that Merck admit they failed to comply with FDA and Medicaid regulations.12

Interestingly, there are published studies showing that Vioxx® was effective against rheumatoid arthritis, but such data is...
irrelevant since the FDA had not “approved” Vioxx® for this indication.11 Our government was more concerned about “regulatory violations” than accurately assessing scientific facts about Vioxx® in the treatment of rheumatoid arthritis.

The rationale you’ll read next for Merck not being charged with felony murder demonstrates the insidious influence pharmaceutical behemoths exert over the federal government.13

**Why Pharmaceutical Companies Aren’t Criminally Prosecuted**

Medicare and Medicaid pay out such a large portion of this nation’s healthcare costs that pharmaceutical companies must maintain access to these government spigots to remain in business.

If a drug company is convicted of “serious healthcare fraud,” they are automatically excluded from receiving federal payouts.

To protect the financial interests of large pharmaceutical companies, the federal government works out specials deals that enables them to avoid accountability for their illicit actions.

In recent years, our government has allowed pharmaceutical companies to escape felony fraud charges, or allows a shell company-subsidiary to take the blame for the parent company’s misdeeds. This is analogous to you committing a murder, but persuading a terminal cancer patient to take the blame for it, and prosecutors then letting you off the hook.

Vioxx® is in a class of drugs known as COX-II inhibitors. Another drug in this class approved by the FDA was Bextra® made by pharmaceutical behemoth Pfizer. Bextra® was also withdrawn because of increased risks of heart attacks, strokes, and deaths in patients prescribed it.14-16

As we reported in 2010, Pfizer was allowed to use a subsidiary shell company to plead guilty to a criminal charge that it fraudulently sold Bextra®,17 The fraud was based on Pfizer promoting Bextra®’s use in higher doses to relieve acute surgical pain, something the drug was never approved for.18 Using a subsidiary to plead guilty to the Bextra® charges enabled Pfizer to continue receiving lucrative Medicare/Medicaid reimbursement on its other drugs.

By allowing the Vioxx® atrocities to be settled on misdemeanor charges instead of felony counts, Merck will continue receiving billions of dollars of annual payments from Medicare/Medicaid.

**Bextra’s Fatal Side Effects Overlooked by FDA**

In an analysis presented at the American Heart Association, Bextra® was shown to more than double the risk of heart attack or stroke. The lead author of this study commented that, “This is a time bomb waiting to go off.”19 Pfizer paid a settlement to the federal government of $1.195 billion for the fraudulent marketing of Bextra®.20 The record financial payout was not because Bextra® injured and killed arthritis patients. The fine was to settle government claims that Pfizer illegally promoted the sale of Bextra® for uses and dosages that the FDA specifically declined to approve.

Just as with Vioxx®, the government bases its Bextra® fine on regulatory violations instead of the fact that human beings were killed!

**No Equal Justice**

The slap-on the wrist settlements of the Vioxx® and Bextra® charges represents an egregious evasion of laws that are supposed to prohibit companies engaged in “serious healthcare fraud” from receiving tax dollars. Of course
none of the individual perpetrators at drug companies that caused these horrific numbers of deaths ever have to worry about jail time.

If a supplement company owner knowingly sold a product that caused even one death, he would likely face decades in prison.

As you’ll read in the first article in this month’s issue, a man named Jay Kimball sold a drug (liquid deprenyl) that harmed no one, but he is still serving out a 13-year prison sentence. The wrongful prosecution of Jay Kimball represents one of the worst miscarriages of justice in the history of the American jurisprudence.

Covering up of Vioxx®’s Lethal Dangers

By April 2001, Merck had compiled internal data from two large human trials showing a staggering three-fold increase in total mortality (deaths) in patients using Vioxx®.22

In articles that reported the results of these trials, analyses and statistical tests of the mortality data were obscured. Even the study author’s conclusion regarding safety of Vioxx® was absurdly stated as the drug being “well tolerated.”23

Data submitted to the FDA was manipulated to understated the higher numbers of deaths in Vioxx® users. For example, if heart attack or stroke deaths occurred more than 14 days after Vioxx® was discontinued, it was often omitted. Just imagine how many heart attack and stroke victims stopped taking Vioxx® because arthritis was no longer their major medical concern. Paralyzed stroke patients, for instance, have little need for Vioxx®, yet many of these stroke victims die more than 14 days after discontinuing Vioxx®.

After the VIGOR study was published showing a 500% increase in myocardial infarction (heart attack) in Vioxx® users,24 Merck directed its sales force to provide physicians with a distorted picture of the relevant scientific evidence.

For instance, Merck sent a bulletin to its Vioxx® sales force of more than 3,000 representatives that ordered: “DO NOT INITIATE DISCUSSIONS ON THE FDA ARTHRITIS ADVISORY COMMITTEE . . . OR THE RESULTS OF THE . . . VIGOR STUDY!”25

The Merck bulletin further advised that if a physician inquired about the VIGOR study, the sales representative should indicate that the study showed a gastrointestinal benefit and then say, “I cannot discuss the study with you.”26

Merck further instructed its sales reps to show those doctors who asked whether Vioxx® caused myocardial infarction a pamphlet called “The Cardiovascular Card.” This pamphlet, prepared by Merck’s marketing department, indicated that Vioxx® was associated with 1/8 the mortality from cardiovascular causes of that found with other anti-inflammatory drugs.

The Cardiovascular Card, however, provided a misleading picture of the evidence on Vioxx®. The card did not include any data from the VIGOR study that showed a 500% increase in heart attack risk. Instead, it presented a pooled analysis of preapproval studies, in most of which low doses of Vioxx® were used for a short time. None of these studies were designed to assess cardiovascular safety, and none included a proper determination of cardiovascular events. In fact, FDA experts had publicly expressed “serious concerns” to the FDA’s advisory committee about using the preapproval studies as evidence of Vioxx®’s cardiovascular safety.24

The cover up of the lethal dangers of Vioxx® spanned a period of years, all the while tens of thousands of innocent victims worldwide perished needlessly.

Merck continues to deny there is any safety problem with Vioxx®.
In comparing Jay Kimball’s case to the real crimes of Merck and Pfizer, the FDA did not even attempt to show that Jay’s liquid deprenyl harmed anyone. The FDA merely cited “regulatory violations” involving his improper export of his liquid deprenyl to other countries. The result is 13-years in jail for Jay Kimball and financial ruination for his family.21

Merck and Pfizer knowingly sold drugs (Vioxx® and Bextra®) that killed tens of thousands of Americans, yet they continue receiving billions of Medicare/Medicaid dollars each year, with no one facing jail time, while their executives lead lavish lifestyles.

Merck Controls Timing of Announcement of Guilty Plea

Even for a company as huge as Merck, pleading guilty to criminal misdemeanors is embarrassing. While the credibility of pharmaceutical companies has sunk to an all-time low, they still pretend to care about the public’s health.

Merck’s guilty plea was announced the day before Thanksgiving (2011), which is one of the busiest travel days of the year and a time when the fewest people are paying attention to the news.

Talk about absolute power, Merck avoids felony charges, jail time for executives, and embarrassing publicity, all while keeping billions of surplus dollars on Vioxx® sales. Jay Kimball, on the other hand, remains incarcerated and his family left indigent.

We Warned Members About Dangers of COX-2 Inhibiting Drugs

While Merck was bombarding the public with television commercials claiming that one little pill a day of Vioxx® took away arthritis pain, Life Extension® warned its members about the lethal dangers of Vioxx® and other drugs that inhibit only the COX-2 enzyme.

We knew that Vioxx®’s mechanism of action would result in sharply higher rates of coronary artery blockage and ischemic stroke. So did scientists who evaluated Vioxx® before the FDA approved it.

Despite the criminal guilty plea, the $950 million settlement, and its withdrawal of Vioxx® worldwide, Merck still denies any wrongdoing on the part of its higher level executives or the company itself.

In this issue, we re-print a fascinating interview with Dr. David Graham, the head of the FDA’s Office of Drug Safety. Dr. Graham provides meticulous details about what really goes on inside the FDA as it relates to approving dangerous drugs, with many specifics about the Vioxx® massacre that should have never happened.

Most important is an article on page 24 of this issue about Jay Kimball, who remains imprisoned for selling a drug that harmed no one. Life Extension and its volunteer members have finally completed a petition to commute the sentence of Jay Kimball to the outlandish time he has already served.
I ask all members to log on to our convenient website www.lef.org/lac to easily affix your name to petitions urging President Obama to immediately grant Jay Kimball a commutation of sentence.

For longer life,

William Falloon

References


More Guilty Pleas by Big Pharma

As we were finalizing this article, GlaxoSmithKline had reached the largest illegal drug settlement to date, agreeing to pay $3 billion and plead guilty to criminal charges that included the drugs Avandia® and Paxil®.26

Avandia® is a drug used to treat type II diabetes. Vascular disease is the leading cause of mortality in diabetic patients.27,28 In a study of 227,571 patients, those receiving Avandia® were 27% more likely to suffer strokes, 25% more likely to develop heart failure and 14% more likely to die compared to those taking another anti-diabetic drug called Actos®.29,30 Avandia® increased the very diseases that diabetic patients are most vulnerable to—and GLAXO covered up these deadly side effects!31

Paxil® is a drug prescribed to treat depression. After years of cover up, Glaxo sent a letter to physicians admitting that the risk of suicidal behavior was 6.7 times higher in study subjects taking Paxil® compared to placebo.32 Suicide risk is high in depressed individuals, yet Glaxo covered up suicidal risks as it promoted the so-called “benefits” of Paxil® in treating depression.32

GLAXO’s guilty plea to criminal charges was announced two days before July 4, 2012, another busy travel time when few Americans are reading the news.

Two weeks after Glaxo’s record settlement, Johnson and Johnson agreed to pay $2.2 billion for its illegal marketing of the drug Risperdal® to demented elderly patients.33 Risperdal® is approved mainly to treat schizophrenia, but is associated with a number of deadly side effects including high blood sugar, irregular pulse, and blood pressure irregularities.34 The most troubling side effect of Risperdal® is impairment of judgment and thinking, which is the last thing a demented patient needs.34

In each of these cases, pharmaceutical companies were promoting drugs that worsened the diseases they were intending to treat. We don’t yet know how their guilty pleas will be manipulated so they don’t lose out on lucrative Medicare/Medicaid reimbursement.


Probiotics literally means "for life." Traditional diets comprising of foods containing probiotics (such as the Mediterranean Diet) have been shown to promote health and longevity.1

People take probiotics to facilitate a healthy GI tract, but probiotics perform many more important functions. For example, researchers have discovered that probiotics inhibit nuclear factor kappa B (NFkB), which helps suppress inflammation as well as positively modulate cellular signaling pathways.2

Furthermore, studies have shown that probiotics can influence youthful gene expression.3 Properly formulated probiotics provide biologically active materials that can positively influence many aspects of human health.4

The Importance of the GI Tract on Immune Function

A little known fact is that 70-80% of our immunoglobulin-producing cells reside in our gut, which is populated by nearly 100 trillion microorganisms, many of which are beneficial bacteria.5 These bacteria are considered a living part of the human organism.5

With age, we can experience a decline in vital beneficial bacteria and the strength of our immune system. Restoring the gut's friendly bacteria can stimulate and regulate healthy immune function.5

A Potent, Immune Enhancing Strain of Bifidobacteria

Researchers have shown that a unique well-studied strain of the bifidobacteria probiotic called BB536® increases the number of healthy bacteria in the colon.6 An in vivo study demonstrated a significant increase in longevity in mice supplemented with bifidobacteria.7 Long studied by Japanese scientists, BB536® was found to reduce production of inflammatory cytokines that often accompany seasonal symptom development.8

BB536® is a highly researched active probiotic. Each capsule provides 2,000,000,000 (two billion) colony forming units of viable healthy bacteria.

A bottle containing 60 capsules of Bifido GI Balance retails for $20. If a member buys four bottles, the price is reduced to just $13.50 per bottle.

Contains milk.

BB536® is a registered trademark of Morinaga Milk Industry Co., Ltd.

References


To order Bifido GI Balance call 1-800-544-4440, or visit www.LifeExtension.com

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.
When Life Extension® introduced standardized green tea extract in 1993, the supplement was very expensive. As more research was published about green tea’s multifaceted benefits, more companies competed to make higher-potency extracts at lower prices.

The good news for consumers is that they can obtain high-potency standardized green tea extract capsules at a fraction of the original price.

The Life Extension Foundation Buyers Club offers 98% green tea extracts in either a lightly caffeinated or decaffeinated form. These 98% extracts are standardized to provide high potencies of critical EGCG, the most important polyphenol found in green tea.

Each capsule of Mega Green Tea Extract provides more polyphenols than are found in three cups of green tea.

These highly concentrated Mega Green Tea Extract Caps contain 725 mg of either lightly caffeinated or decaffeinated 98% standardized green tea extracts. The retail price for a 100 vegetarian capsules bottle of Mega Green Tea Extract is $28.

If a member buys four bottles of 725 mg Mega Green Tea Extract capsules, the price is reduced to $19.88 per bottle or as low as $6.41 a month based on the typical intake of just one capsule a day. Contains rice.

To order Mega Green Tea Extract, call 1-800-544-4440 or visit www.LifeExtension.com
Systemic inflammation is involved in most undesirable aging processes. Life Extension members have access to a state-of-the-art nutritional formula called MITOCHONDRIAL ENERGY OPTIMIZER WITH BioPQQ™ that helps protect delicate cellular structures and enables cells to perform life-sustaining metabolic processes.

Mitochondrial Energy Optimizer with BioPQQ™ is designed to counteract age-related structural and functional changes by providing the following unique ingredients:

- **Carnosine**: As humans age, proteins in their bodies become irreversibly damaged by glycation reactions. Glycation is the cross-linking of proteins and sugar to form non-functioning structures called advanced glycation end products in the body, which can lead to alterations of normal cell function. Carnosine is not only a powerful anti-glycating agent, but it also protects neurons against reactive and cytotoxic protein carbonyl species associated with normal aging.1,2

- **POQ**: This breakthrough micronutrient has been shown to trigger mitochondrial biogenesis—the growth of new mitochondria in aging cells! POQ also activates genes involved in protecting the delicate structures within the mitochondria.3-5

- **Luteolin**: Systemic inflammation is involved in most undesirable consequences of aging. Culprits behind inflammatory reactions are pro-inflammatory cytokines, such as interleukin-1 and tumor necrosis factor-alpha. Luteolin is a flavonoid that has been shown to help suppress these inflammatory cytokines.6-10

- **Benfotiamine**: Effectively modulates multiple destructive biochemical pathways that are induced by higher than desirable blood glucose levels. Human mortality studies indicate that ideal fasting glucose levels are between 74–85 mg/dL. Yet many aging people have fasting glucose above 90 mg/dL, which is less than optimal.11-15 Benfotiamine protects endothelial cell integrity from the effects of high glucose levels. In addition, benfotiamine exhibits direct antioxidative capacity and supports DNA function.16

- **Pyridoxal 5’-Phosphate (Bio-Enhanced®)**: Aging results in the formation of advanced glycation end products throughout the body. Pyridoxal 5’-Phosphate is the active form of vitamin B6 that has been shown to protect against both lipid and protein glycation reactions.17-21

- **R-Lipoic Acid**: Destructive free-radical activity in the mitochondria plays a major role in the loss of cellular vitality. A microencapsulated Bio-Enhanced® R-Lipoic acid facilitates youthful mitochondrial energy output while guarding against free radicals. Two forms of lipoic acid are sold on the supplement market, but R-Lipoic acid is far more potent.22-26

- **Acetyl-L-Carnitine Arginate**: The amino acid L-carnitine is required for mitochondrial energy output. The amino acid L-carnitine arginate is a patented form of carnitine that also supports neurites in the brain.27-29

Taking all of the individual ingredients in the Mitochondrial Energy Optimizer with BioPQQ™ separately would be prohibitively expensive, but Life Extension members obtain this comprehensive formula at substantial savings.

A bottle of Mitochondrial Energy Optimizer with BioPQQ™ containing 120 capsules retails for $94. If a member buys four bottles, the price is reduced to $63 per bottle. Contains soybeans.

**Just four capsules of Mitochondrial Energy Optimizer with BioPQQ™ provide:**

- **Carnosine** 1000 mg
- **ArginoCarn® Acetyl-L-carnitine arginate DIHCl** 675 mg
- **R-Lipoic acid** (as microencapsulated Bio-Enhanced®) 150 mg
- **Benfotiamine** 150 mg
- **Pyridoxal 5’-Phosphate** 100 mg
- **BioPQQ™** 10 mg
- **Luteolin** 8 mg

**To order Mitochondrial Energy Optimizer with BioPQQ™, call 1-800-544-4440 or visit www.LifeExtension.com**

**References**
2. Prooger Par Life. 2006;10(15):162-71
3. Alzheimer Res. 2007 Nov;10(5):229-38
18. J Biol Chem. 2006 Sep 1;281(35):26003-10

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.
IN THE NEWS

Take Your Vitamin D with Largest Meal of the Day

Vitamin D is a fat-soluble nutrient that does not absorb well on an empty stomach or with a small meal.

A study evaluated a small group of people who took vitamin D on an empty stomach or with a light meal. When these people were instructed instead to take their vitamin D with the largest meal of the day, there was a remarkable 56.7% increase in serum blood (25-hydroxyvitamin D) levels after two to three months.*

This study, conducted at the Cleveland Clinic Foundation Bone Clinic, demonstrates how much better fat-soluble nutrients absorb when taken with a meal that contains some fat, which is usually the heaviest meal of the day. It helps explain why people who take higher doses of vitamin D sometimes fail to achieve optimal blood levels of 25-hydroxyvitamin D (over 50 ng/mL.)

Nutrients that should be taken with heaviest meal of the day include fish oil, lycopene, lutein, zeaxanthin, gamma tocopherol, astaxanthin, and of course, vitamin D.


Lower DHEA Levels Associated with Higher Risk of Cardiovascular Disease

The Endocrine Society’s Annual Meeting was the site of a presentation of the finding of a protective effect for higher levels of dehydroepiandrosterone (DHEA) against the risk of cardiovascular events in men.*

Asa Tivesten, MD, and colleagues analyzed data from 2,416 men enrolled in the Osteoporotic Fractures in Men Sweden study. Blood samples obtained upon enrollment were analyzed for DHEA and DHEA sulfate (DHEA-S).

Over a five year follow-up, 485 cases of fatal or nonfatal cardiovascular events were documented. Having a higher serum DHEA was associated with a lower risk of cardiovascular events, as was having a higher level of DHEA-S. Men whose DHEA-S was among the lowest one-fourth participants had a 25% higher risk of events compared to the rest of the subjects, and those whose levels of both DHEA and DHEA-S were among the lowest fourth had a 34% higher risk of any major cardiovascular event.

Editor’s Note: DHEA, produced by the adrenal glands, acts as a precursor to the hormones estradiol and testosterone. While some research findings have suggested an association between increased DHEA levels and a reduction in heart disease, the majority of the studies involving DHEA have been small and results have not always been conclusive.

—D. Dye

Metformin Shows Promise for the Treatment of Pancreatic Cancer

At the Pancreatic Cancer: Progress and Challenges conference, Christopher Heeschen, MD, PhD, reported positive results for metformin in experiments involving pancreatic cancer cell cultures and mice implanted with pancreatic cancer tumors.* The drug helps eliminate cancer stem cells, a population of cells that are resistant to chemotherapy and which may be responsible for the initiation and recurrence of the disease.

Pretreatment of pancreatic ductal adenocarcinoma cancer stem cells with metformin resulted in activation of AMPK, an enzyme that helps regulate cellular energy. Treatment with a combination of gemcitabine (the standard chemotherapy for pancreatic cancer) and metformin eradicated cancer stem cells as well as other malignant cells. When Dr. Heeschen’s team implanted immunocompromised mice with pancreatic cancer tumors and treated them with gemcitabine and/or metformin, animals that received both drugs had fewer tumors and a lower incidence of relapse in comparison with those that received either drug alone.

**Editor’s Note:** Metformin is currently prescribed to diabetic patients and has shown potential as a cancer preventive and treatment, in addition to other possible uses.

—D. Dye

* American Association for Cancer Research Pancreatic Cancer: Progress and Challenges, June 18-21, 2012, Lake Tahoe, NV.

Exercise May Be Needed for Dietary Restriction Benefits

In the journal *Cell Metabolism*, scientists at the Buck Institute for Research on Aging report the outcome of experiments that suggest that it may be necessary to be physically active in order to derive maximum benefit from dietary restriction (DR). Significant restriction of the intake of a particular nutrient or total calories has extended the life span of numerous species in laboratory experiments; however, researchers are still clarifying the mechanisms involved in the technique.*

In a study involving fruit flies, Pankaj Kapahi, PhD, and colleagues observed that the insects became more physically active when their protein source was restricted. The increased physical activity observed in the dietary-restricted flies was associated with greater fat synthesis and breakdown. When fat synthesis in muscle tissue was blocked, so was the life-extending benefit of dietary restriction. And in flies whose motion was limited, the extended life span that normally results from a restricted diet did not occur.

**Editor’s Note:** The researchers additionally determined that in flies genetically engineered to overexpress the hormone AKH (Adipokinetic Hormone), metabolism and activity levels were enhanced and life span was extended, even without dietary restriction. The authors suggest that molecules such as AKH could potentially serve as a dietary restriction mimetic.

—D. Dye

* *Cell Metab.* 2012 Jul 3;16:97-103.

Higher Dose Vitamin D Needed for Fracture Prevention

A pooled analysis of 11 clinical trials reported in a recent issue of the *New England Journal of Medicine* reveals a protective effect for high dose vitamin D supplementation against the risk of fracture in older men and women. While 800 IU or more of the vitamin was associated with reduced fracture risk, lower doses did not appear to be effective.

Scientists analyzed data from 31,022 individuals age 65 and older who were assigned to receive oral vitamin D or a placebo in one of 11 randomized, controlled trials. Among those whose vitamin D was among the top 25% of subjects at a median dose of 800 IU per day, there was a 30% lower adjusted risk of hip fracture and a 14% lower risk of nonvertebral fractures in comparison with those whose vitamin D intake was lowest.

**Editor’s Note:** The study found no fracture-preventive benefit for doses lower than 800 IU per day, indicating that higher doses may be needed, particularly among those at risk for osteoporosis and fracture. This study publishes what Life Extension has already used to rebut government recommendations against vitamin D.

—D. Dye

Life Extension® Supports Nutritional Research in Chronic Kidney Disease

In a study supported by Life Extension®, recognized by the National Kidney Foundation, and published in the *Journal of Renal Nutrition*, researchers in Texas evaluated the effects of fish oil ingestion in thirty-one patients with chronic kidney disease (CKD).*

The scientists conducted a double-blind, randomized, placebo-controlled trial in non-dialysis chronic kidney disease patients to evaluate a nutritional supplement vs. placebo upon a variety of proinflammatory parameters. The cytokines evaluated in the study included interleukin 1b (IL-1b) and interleukin 6 (IL-6). The active treatment group received fish oil containing 1,400 mg of EPA and 1,000 mg of DHA daily, along with olive fruit extract (600 mg daily), and sesame lignans (20 mg daily).

The researchers discovered that fish oil, olive fruit extract, and sesame lignans had a significant, beneficial effect upon the inflammatory cytokine IL-1b with lower IL-1b levels in those taking fish oil-olive fruit-sesame lignans compared to the inactive placebo group.

Editor’s Note: An important consideration in chronic kidney disease, a leading cause of disability in the United States, is excess production of proinflammatory factors called cytokines. These inflammatory factors are implicated in a variety of health conditions, including cardiovascular and joint health, as well as kidney health.

—D. Dye

Iron Supplementation Reduces Fatigue in Premenopausal Women

The results of a trial described in the *Canadian Medical Association Journal* reveal a benefit for iron supplements in iron-deficient (but nonanemic) premenopausal women who experienced fatigue.*

Dr. Bernard Favrat and his associates enrolled 198 women aged 18 to 53 for the current trial. Participants were limited to those who had deficient serum ferritin levels of less than 50 micrograms per liter and hemoglobin levels above 12 grams per deciliter. Subjects were divided to receive 80 milligrams iron or a placebo daily for 12 weeks. Fatigue was evaluated at the beginning and end of the study, and blood samples were analyzed for hemoglobin and ferritin at baseline and at 6 and 12 weeks.

Hemoglobin, ferritin, and other factors increased after 6 weeks among women who received iron and continued to be improved at 12 weeks, in contrast with the placebo group, for whom some values declined by the end of the study.

Editor’s Note: Reduced iron levels are common among women of childbearing age; however, consuming too much iron increases free radical damage, which has been linked to a number of diseases.

—D. Dye

Researchers Recommend Increase in Vitamin C Dietary Allowance

Scientists at Oregon State University’s Linus Pauling Institute are proposing an increase in the recommended dietary allowance (RDA) for vitamin C from the current level of 90 milligrams per day for men and 75 milligrams for women, to a modest intake of 200 milligrams. Writing in a recent issue of *Critical Reviews in Food Science and Nutrition*, Professor Balz Frei and his colleagues observe that the current RDA is based on the amount necessary to prevent scurvy and that present methods of evaluating nutrients such as vitamin C have often failed to find further disease-preventive benefits due to faulty methodology.*

Dr. Frei and his coauthors argue that these trials do not always demonstrate the protective properties of compounds already present in the human body, whose benefits may be evident only after many years of optimal intake.

Editor’s Note: The authors remark that increased long-term intake of vitamin C will provide greater tissue saturation at a cost of only a penny per day if consumed as a supplement, resulting in a significant payoff of lowered risks of cardiovascular disease and cancer as well as a reduction in the conditions that contribute to these diseases, including inflammation.

—D. Dye


IN THE NEWS

Bees Can Reverse Brain Aging, May Hold Clues for Alzheimer’s

In a recent study published in the journal Experimental Gerontology, a team of scientists from Arizona State University (ASU) and the Norwegian University of Life Sciences, led by Gro Amdam, an associate professor in ASU’s School of Life Sciences, presented findings that show that tricking older, foraging bees into doing social tasks inside the nest causes changes in the molecular structure of their brains.*

“We knew from previous research that when bees stay in the nest and take care of larvae – the bee babies – they remain mentally competent for as long as we observe them,” said Amdam. “However, after a period of nursing, bees fly out gathering food and begin aging very quickly. After just two weeks, foraging bees have worn wings, hairless bodies, and more importantly, lose brain function – basically measured as the ability to learn new things. We wanted to find out if there was plasticity in this aging pattern so we asked the question, ‘What would happen if we asked the foraging bees to take care of larval babies again?’

Researchers discovered that after 10 days, about 50% of the older bees caring for the nest and larvae had significantly improved their ability to learn new things.

“Maybe social interventions – changing how you deal with your surroundings – is something we can do today to help our brains stay younger,” said Amdam. “Since the proteins being researched in people are the same proteins bees have, these proteins may be able to spontaneously respond to specific social experiences.”

—M. Richmond


Metformin May Make Brain Cells Grow

A recent study in Cell Stem Cell reports on an interesting and potentially beneficial side effect of the diabetes drug metformin: it may encourage the growth of new neurons in the brain.* In mice, this new growth lead to improved intelligence.

Freda Miller, the study’s lead author from the University of Toronto-affiliated Hospital for Sick Children is encouraged because the drug is already widely used and considered safe. Mice who took the metformin displayed a plethora of new neurons and it was observed that they had an easier time with some standard mazes during spatial learning tests.

While many people taking metformin have reported some form of cognitive improvement, up until now that was attributed to better control of the diabetes. The possibility is now open that the daily doses of metformin were responsible for these improvements. This discovery could hold the key to successfully treating Alzheimer’s symptoms.

—M. Richmond


Generic Plavix Competitors Set to Distribute

In a win for insurance companies and those paying out of pocket for anti-clotting drugs, the patent for the blockbuster drug, Plavix®, recently expired. Shortly following the expiration, the FDA moved quickly to approve upwards of ten generic versions of the drug.*

Plavix®, made by Bristol-Myers Squib, is one of the most profitable drugs of all time and has been used for secondary prevention of heart attacks and stroke in patients who have suffered these events.

With the generic version soon becoming readily available, it is expected that insurance companies will automatically switch patients over to the less expensive version. According to Bristol-Meyer’s Squib’s 2011 annual report, they state that they “expect a rapid, precipitous, and material decline in Plavix® net sales” once generic drugs hit the market.

—M. Richmond

There’s no debating the power of omega-3 fatty acids. From support for heart health and brain function to help with inflammation, their broad-spectrum benefits have been firmly established in a wealth of studies.1-9

To ensure the purest, most stable, and easy-to-tolerate fish oil supplement, Life Extension® SUPER OMEGA-3 EPA/DHA is molecularly distilled. This proprietary technology ensures any environmental pollutants are reduced to extremely low levels. The result? Our fish oil enjoys a 5-star rating for purity, quality, and concentration from the International Fish Oil Standards program (IFOS)—the highest possible ranking from the world’s premier testing laboratory.

Sesame Lignans and Standardized Olive Fruit Extract for Enhanced Benefits

Fish oils (and other fatty acids) have a tendency to oxidize, rendering them nutritionally inferior. Scientific studies show that when added to fish oil, sesame lignans safeguard against oxidation and direct fatty acids toward pathways that help with inflammatory reactions.10

To further emulate the benefits of a Mediterranean diet, Super Omega-3 delivers high-potency olive fruit extract. Research shows that fish oil combined with olive oil helps with inflammation better than fish oil alone.11

Olive also contains the compounds hydroxytyrosol, tyrosol, and oleuropein. Together these nutrients counter the action of free radicals, delay aging in specialized skin cells, prevent undesirable LDL oxidation, and help maintain normal platelet activation.12-15

Super Omega-3 (4 regular size softgels) supplies the equivalent content of 6 tablespoons of extra virgin olive oil. Take two softgels twice daily with meals.

A bottle containing 120 softgels of Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract retails for $32. If a member buys four bottles, the price is reduced to just $21 per bottle. If 10 bottles are purchased, the cost is just $18.68 per bottle. (Item # 01482)

A SMALLER SOFTGEL for easier swallowing!

Some members have requested we make Super Omega-3 available in a smaller capsule for easier swallowing. We have accomplished this by making half-size softgels available.

A bottle containing 240 half-size softgels of Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract retails for $34. If a member buys four bottles, the price is reduced to just $21 per bottle. If 10 bottles are purchased, the cost is just $18.68 per bottle. (Item # 01619)

For those with sensitive stomachs, Super Omega-3 is also available with enteric coating and retails for $34. If a member buys four bottles, the price is reduced to $23.25 per bottle. If 10 bottles are purchased, the cost is just $21 per bottle. (Item # 01484)

To order the most advanced fish oil supplement, Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract (with or without enteric coating), 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.
Most Popular DHEA Dosages

DHEA is a critically important hormone, but its production declines sharply as we age. Scientists are discovering numerous health benefits when aging people restore their DHEA to youthful ranges. Life Extension offers a wide range of DHEA supplements to satisfy individual needs.

DHEA 25 mg, 100 Dissolve-in-Mouth Tablets
The minimum dose of DHEA for most healthy aging people is 25 mg a day, though optimal doses are often higher in men. These 25 mg capsules are a popular way to consume the precise amount of DHEA your body may need. A bottle containing 100 25 mg capsules of DHEA retails for $14; if a member orders four, the price is reduced to just $9.38 per bottle.

Contains corn.

DHEA 25 mg, 100 Capsules
The minimum dose of DHEA for most healthy aging people is 25 mg a day, though optimal doses are often higher in men. These 25 mg capsules are a popular way to consume the precise amount of DHEA your body may need. A bottle containing 100 25 mg capsules of DHEA retails for $15; if a member orders four, the price is reduced to just $9.38 per bottle.

Contains rice.

DHEA 15 mg, 100 Capsules
While published studies show the greatest benefit occurs when 50-75 mg of DHEA is consumed each day, some women only need a low dose of DHEA. Just one of these 15 mg capsules a day is all some women need to bring DHEA levels back to youthful levels. A bottle containing 100 15 mg capsules of DHEA retails for $12; if a member orders four bottles, the price is reduced to just $7.50 per bottle.

Contains rice.

DHEA 50 mg, 60 Capsules
The optimal daily dose of DHEA for most people is 50 mg. These economical 50 mg capsules enable most people to conveniently consume the optimal dose of DHEA in just one capsule. A bottle containing 60 50 mg capsules of DHEA retails for $16; if a member orders four bottles, the price is reduced to just $10.50 per bottle.

Contains rice.

DHEA 25 mg, 100 Dissolve-in-Mouth Tablets
A bottle containing 100 25 mg dissolve-in-mouth tablets of DHEA retails for $14; if a member orders four bottles, the price is reduced to just $8.81 per bottle.

Some people want to take DHEA in sublingual tablet form to avoid first pass through the liver, though published studies show that swallowing DHEA capsules consistently boosts blood DHEA levels already within normal range. Contains corn

CAUTION: Do not use DHEA if you are at risk for or have been diagnosed as having any type of hormonal cancer, such as prostate or breast cancer.

To order the DHEA supplement that’s right for you, 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.
Vitamin D3 1,000 IU 250 capsules
Retail: $12.50
Four-bottle Member Price: $8.44 ea.
Commercial companies offered only 400 IU vitamin D products when Life Extension long ago introduced this 1,000 IU version. For most people, this 1,000 IU potency is insufficient to attain optimal vitamin D blood levels. For smaller individuals who obtain 2,000-3,000 IU in their multi-nutrient formulas (and children), this potency of vitamin D may be suitable.
Item # 00251
Please refer to website for allergen information.

Vitamin D3 5,000 IU 60 capsules
Retail: $11
Four-bottle Member Price: $7.43 ea.
For those obtaining 1,000-3,000 IU of vitamin D in their multi-nutrient formulas, this 5,000 IU potency is what most need to achieve optimal vitamin D blood levels.
Item # 00713
Please refer to website for allergen information.

Vitamin D3 7,000 IU 60 capsules
Retail: $14
Four-bottle Member Price: $9.45 ea.
Some individuals (such as those weighing more than 180 pounds) may require higher potencies of vitamin D. When combined with 1,000-3,000 IU obtained from multi-nutrient formulas, this 7,000 IU vitamin D3 capsule should enable these individuals to attain 25-hydroxyvitamin D blood levels above the desired range of 50 ng/mL.
Item # 01418
Please refer to website for allergen information.

Vitamin D3 5,000 IU with Sea-Iodine™ 60 vegetarian capsules
Retail: $14
Four-bottle Member Price: $9.38 ea.
Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining 5,000 IU of vitamin D3 and 1,000 mcg of iodine into one capsule makes taking these two nutrients economical and convenient.
Item # 01372
Please refer to website for allergen information.

Vitamin D3 Liquid Emulsion 2,000 IU 1 ounce
Retail: $28
Four-bottle Member Price: $18.75 ea.
For those rare individuals who have difficulty absorbing enough vitamin D3 from powdered capsules, this liquid emulsion of vitamin D can be used.
Item # 00864
Please refer to website for allergen information.

Which VITAMIN D is Right for You?
Study after study confirms the vital importance of maintaining optimal levels of vitamin D for broad-spectrum health benefits. Research often indicates that a blood level of 50 ng/mL of 25-hydroxyvitamin D is ideal.
Because people have individual requirements, Life Extension® has created the largest selection of vitamin D supplements available to ensure that you achieve your vitamin D3 goals, including a 5,000 IU vitamin D formula that also provides 1,000 mcg of iodine per capsule.
Keep in mind that you may already be getting 1,000-3,000 IU of vitamin D in your multi-nutrient formula.

To order any of these high-potency vitamin D3 supplements, 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-hydroxyvitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with hypercalcemia (high blood calcium levels). People with kidney disease, certain medical conditions (such as hyperparathyroidism or sarcoidosis), and those who use cardiac glycosides (digoxin) or thiazide diuretics should consult a physician before using supplemental vitamin D.
* If you have a thyroid condition or are taking antithyroid medications, do not use without consulting your healthcare practitioner.

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.
A TRAGIC MISCARRIAGE OF JUSTICE

We Must Convince the President to Release JAY KIMBALL
Back in the year 2004, we dedicated an issue of Life Extension® magazine to the growing threat of wrongful prosecutions that were not based on real “crimes.”

These prosecutions are instead instigated to serve private business interests, sometimes by pharmaceutical companies that pay ‘investigators’ to find ways to destroy their small competitors.

With their enormous political influence, drug companies use these private investigations to persuade the federal government to arrest smaller competitors. The result is that innovative companies offering superior medications at lower prices are destroyed.

Pharmaceutical companies financially flourish, while consumers and the healthcare system of the United States collapses under the weight of this relentless corruption. >>
The most egregious example of prosecutorial misconduct occurred in 2000, when a man named Jay Kimball was sentenced to 13 years in jail for exporting a lower cost liquid deprenyl that may have been superior to the deprenyl tablets being sold for obscenely high prices in the US. The company making the deprenyl tablets launched a massive “private” investigation against Jay Kimball, and then turned their report over to the FDA and Justice Department.

Contrary to the 100,000 Americans who die each year from Big Pharma’s fraudulently-approved drugs, nothing in the private report suggested anyone was harmed by Jay’s products. Jay was nonetheless arrested on technical violations of pharmaceutical “export” laws and punished with such a draconian sentence that he may not leave prison alive unless we succeed in convincing President Obama to vacate his prison sentence to the many years he has already served. This legal process is called “commutation of sentence” and allows the President to order the release of a prisoner but does not nullify the conviction itself.

After reading this article, I urge each of you to contact President Obama’s pardon commission at the Internet address we provide to petition for the immediate release of a human being who did nothing more than to provide a superior medication at a lower cost.

**Deprenyl May Be An Anti-Aging Drug**

Deprenyl is a drug the FDA approved to treat early-stage Parkinson’s disease. It had long before been used throughout Europe. Deprenyl enhances and prolongs the anti-Parkinson effects of standard drugs like L-dopa.

Deprenyl has also demonstrated intriguing anti-aging properties. Deprenyl may help aging humans regain the dopamine levels that progressively depletes after age 45 in humans. When levels reach 13% each decade. When the dopamine content in the brain reaches about 30% of normal, Parkinson’s symptoms may be present. When levels reach 10% of normal, death ensues. This has led to the hypothesis that if we live long enough, we will develop Parkinson’s symptoms due to dopamine depletion in our brains.

Monoamineoxidase B (MAO-B) is an enzyme in the brain that degrades neurotransmitters like dopamine. As humans age, MAO-B levels increase and degrade precious dopamine and other neurotransmitters. Deprenyl is a selective inhibitor of MAO-B. As little as 5 mg twice a week of deprenyl is all aging human may need to maintain their dopamine at youthful levels.

Not only may deprenyl help prevent degenerative brain diseases, but it can also improve the quality of life, as evidenced by increased ‘mounting frequency’ in old male rats treated with deprenyl compared to untreated controls.

Dopamine is a primary “feel good” neurotransmitter that progressively depletes after age 45 in humans. Restoring dopamine levels using low-dose deprenyl (5 mg twice a week) may help aging humans regain some of their youthful sense of well being.

**Jay Kimball’s Liquid Deprenyl**

Deprenyl is now a generic, but when the patent was in force, it sold for a lot of money. Because of the inefficient regulatory environment that limits free market competition, generic deprenyl costs about the same now as when it was covered under a patent.

Jay Kimball had developed a purified liquid deprenyl that he claimed was superior to the outlandishly priced tablets the FDA had approved for Parkinson’s patients. Jay first started selling his liquid deprenyl over-the-counter in the United States. When the FDA ordered him to stop, he capitulated as his small company lacked the resources to take on the FDA (and Big Pharma) in court. Jay continued, however, to export his liquid deprenyl to other countries.

You might ask, what is wrong with exporting medicines to other countries? It turns out that unless the FDA first approves the export, even sending a medication to other countries is “illegal.”

**Pharmaceutical Company Destroys Jay Kimball**

The pharmaceutical company that sold deprenyl tablets became outraged when Americans who wanted Jay’s purportedly superior liquid deprenyl began ordering it from other countries. That is when Jay got into big trouble.

The company making deprenyl tablets did not like the low-priced competition, so it ran to the FDA demanding that Jay Kimball be stopped. The FDA did not move fast enough to suit the drug company, so it hired a private detective agency to conduct a criminal investigation independent of the government. The private detectives did a superb job of documenting that Jay was indeed shipping deprenyl to other countries. This file was turned over to the FDA, which used the information supplied by the private investigators to raid Jay Kimball’s premises and eventually indict him on numerous criminal counts. There were no victims of Jay Kimball’s actions, just violations of FDA “export” regulations.
What happened after Jay was indicted is so unprecedented that few attorneys believe the story until they read it. Just from watching TV, most Americans are aware that defendants are entitled to an attorney and that if they cannot afford one, an attorney will be appointed and paid for by the government. In fact, the government is often quite generous in providing a free attorney for violent street criminals. If you murder someone, the government will sometimes pay an expert criminal defense attorney huge fees so that the “incompetent counsel” argument cannot be used to overturn a death penalty sentence.

Jay did not kill or injure anyone, but he was denied an attorney for his trial. Jay’s problem was that he was not indigent, as are most street criminals. Jay had some money to feed his wife and then 13-year-old son and to provide housing for them. The federal government demanded that Jay liquidate all of his assets to pay for an attorney, or else represent himself in court. That would have meant that his wife and son would have to live on the street.

The federal prosecutors offered him a relatively lenient sentence if he pleaded guilty, but Jay defiantly stated that he had not harmed anyone and did not believe he did anything wrong. Jay was told that if he did not plead guilty, he faced up to 3 years in prison if convicted. Jay pleaded for an attorney, but since he was not flat broke, the government would not pay for one. Jay thus had to represent himself in court against the federal prosecutors, the FDA, and the drug company’s private detectives.

Having never practiced law, Jay did an abysmal job of defending himself and managed to get the judge to despise him in the process. After the jury found Jay guilty, the judge sentenced him to an astounding 13 years in jail, citing Jay’s conduct in trial as a reason to add 10 years to what had been a maximum three year imprisonment.\(^1\)

**Health Freedom Activists Try to Help**

When news spread that Jay Kimball was sentenced to 13 years in jail for FDA violations that had harmed no one,\(^2\) the health freedom community was outraged. Jay was denied the basic right to have an attorney represent him, and then was sentenced to 10 years beyond the maximum sentence he was told he would face prior to trial. Federal rules mandate that defendants be told their maximum prison sentence exposure in order to determine whether a guilty plea is appropriate.

While Jay had no legal resources to fight with during his trial, donations poured in after his conviction. An appeal was filed seeking to overturn the 10 additional years the judge had arbitrarily and unjustly imposed on him. Despite the best efforts of one of the nation’s leading criminal defense firms, the appeal was denied (as most are nowadays).

Jay made it clear to the judge that he was a political dissident and did not recognize the FDA’s authority over him. Jay had become the embodiment of a “political prisoner.” As is the case in all police-state countries, this meant he would be sent to the harshest jails the Bureau of Prisons could find. He endured filthy county jails in the beginning and then was sent to one of the worst jails (in Belle Glade, FL), where third-world-like squalor breeds infectious diseases among prisoners.\(^3\) Jay contracted traumatic injuries at the hands of guards and infectious diseases that almost killed him. Medical treatment was repeatedly denied.

When the government identifies a political dissident, the punishment often greatly exceeds that of a common street criminal. After all, a dissident dares challenge the very authority of the government itself. An example of this barbaric behavior was Saddam Hussein, who jailed those who committed street crimes but summarily executed those suspected of questioning his absolute authority. The same was true of Adolf Hitler’s death camps. Eleven million people were murdered in the Nazi death camps. Six million of those were Jews, with the remainder consisting of

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**Special Gratitude to Maria Miller for Her Volunteer Work**

If it were not for the tireless volunteer work of one of our members, Maria Miller, we would not have been able to maintain contact with Jay Kimball, nor complete the application for commutation of sentence.

Jay Kimball has been denied many rights during his incarceration and has been repeatedly moved to different prison hospitals to treat his health ailments. (Jay is over 70-years-old).

To initiate this commutation of sentence application, Maria Miller was promised a visit with Jay Kimball. After driving for eight hours, prison officials denied Maria access to Jay despite promising the visitation over the phone.

Maria Miller does not know Jay Kimball, but after reading the lengthy court transcripts showing egregious government misconduct, she became as passionate as other health freedom activists have when they learn how our federal government treats its political prisoners.

Please log on to [www.lef.org/lac](http://www.lef.org/lac) to petition The White House to commute the sentence of Jay Kimball.
unpopular ethnic groups, gypsies, homosexuals, those with physical or mental disabilities, and political dissidents.

We Must Stand Together and Insist That President Obama Commute Jay Kimball’s Sentence

The pharmaceutical company-motivated indictment, the trial without a defense lawyer and brutal incarceration of Jay Kimball is an abomination on the US justice system.

Based on the enormous growth of Life Extension membership over the past eight years, along with a huge number of pro-freedom groups we have allied ourselves with; I believe we can generate enough letters to President Obama’s pardon commission to commute Jay Kimballs’ sentence to “time served,” which is now the better part of a decade.

Prosecutorial misconduct affecting ordinary Americans is growing worse each year. One way of helping to stop this police-state oppression is to convince President Obama to liberate the wrongfully prosecuted and incarcerated Jay Kimball.

Please log on to the special website we have set up (www.lef.org/lac) to sign your name to petitions we are sending to The White House and the Presidential Pardon Commission that demands the immediate release of Jay Kimball.

Challenges We Have Confronted

It has taken us years to get to this point where we can effectively rally health freedom activists to petition the President of the United States to release Jay Kimball.

Jay has made it easy as he has up till now refused to allow us to petition for commutation of sentence. Jay instead relentlessly filed appeals showing in meticulous detail the wrongful nature of his conviction and the illegality of the 13-year sentence.

While imprisoned, Jay’s wife developed serious health problems. Jay made a monumental mistake of escaping prison in an attempt to save his wife’s life. After Jay developed his own health problems and checked into a hospital using his Medicare account number, he was re-arrested (but not prosecuted for escape). His wife died afterwards from metastatic breast cancer. His daughter now suffers stage IV breast cancer.

The carnage inflicted on Jay Kimball and his family by this miscarriage of justice defies words.

We Must Stand Together and Insist That President Obama Commute Jay Kimball’s Sentence

Please log on to www.lef.org/lac

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

References

1. Knoll J. Antiaging compounds: (-)deprenyl (selegeline) and (+)-1-(benzofuran-2-yl)-2-propylaminopentane, [(-)BPAP], a selective highly potent enhancer of the impulse propagation mediated release of catecholamin. CNS Drug Rev. 2001 Fall;7(3):317-45.

OCTOBER 2012

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References

1. Knoll J. Antiaging compounds: (-)deprenyl (selegeline) and (+)-1-(benzofuran-2-yl)-2-propylaminopentane, [(-)BPAP], a selective highly potent enhancer of the impulse propagation mediated release of catecholamin. CNS Drug Rev. 2001 Fall;7(3):317-45.
Petition for Redress of Grievances

Tragic Miscarriage of Justice

We request President Obama
Commute the Sentence of Jay Kimball

In 2000, a man named Jay Kimball was sentenced to 13 years in jail for selling a deprenyl liquid that claimed to be superior to deprenyl tablets.

The prosecution was initiated by a competitor that made the deprenyl tablets. The competing company funded a “private” investigation against Jay Kimball, and then turned their report over to the FDA and Justice Department.

Nothing in the private report suggested anyone was harmed by Jay Kimball’s products.

Jay was nonetheless arrested on technical violations of the Food, Drug and Cosmetic Act, tried without legal representation, and then punished with a prison sentence far beyond the maximum of three years stated by prosecutors in pre-trial hearings.

Jay Kimball has spent 10 years imprisoned, sometimes under deplorable conditions. He is 72 years old, in poor health, and may not live long enough to be released by his scheduled date of June 15, 2015.

We are petitioning you, the President, to commute the sentence of Jay Kimball to the time he has already spent incarcerated. He represents no danger to society, and it would save considerable tax dollars if he were released. His punishment has already exceeded that of anyone similarly situated, so your commutation would not affect deterrence.

We acknowledge that Jay Kimball should not have escaped in 2005, but ask that you look at the mitigating circumstances, in particular the 13-year sentence that went ten years beyond the three years that was supposed to be the maximum amount of time he faced if he refused to plead guilty.

Jay Kimball has always maintained that his actions were not illegal.

The Office of the Pardon Attorney has in their files specific details about this case that provide a compelling basis to question why Jay Kimball was criminally prosecuted, let alone the 13-year prison sentence.

We the undersigned request, you, President Barack Obama, commute the sentence of Jay Kimball to the time he has already served.

NAME

ADDRESS

SIGNATURE

SEND TO:

Office of the Pardon Attorney
Attn: Ronald L. Rodgers
1425 New York Avenue, NW
Suite 11000
Washington, DC 20530
(202) 616-6070

President Barack Obama
The White House
1600 Pennsylvania Avenue Northwest
Washington, DC 20500
(202) 456-2121

(You can also send this petition by logging on to www.lef.org/lac)
A bottle containing 60 vegetarian capsules of Olive Leaf Vascular Support retails for $22. If a member buys four bottles, the price is reduced to $15 per bottle.

Many of the validated benefits of the Mediterranean diet derive from heart-healthy compounds contained in the olive fruit, including the polyphenols tyrosol and hydroxytyrosol.\(^1\)\(^4\)

When it comes to olive's power to support blood pressure already within a healthy range, research shows the bioactive compound oleuropein\(^5\)\(^8\) is primarily responsible.

The problem is that optimal amounts of oleuropein are not found in the fruit. The highest concentrations of oleuropein are contained in the olive leaf\(^9\)\(^13\)—a part of the plant that is neither readily available nor commonly consumed.

Oleuropein normally degrades during standard food processing. For this reason, Life Extension® introduces Olive Leaf Vascular Support.

Olive Leaf Vascular Support consists of a patented, standardized oleuropein extract using a unique, gentle-processing technique.

Researchers using 1,000 mg per day of this formulation in a double-blind, controlled clinical trial documented an average 11.5-point (mmHg) decline in systolic readings and 4.8-point drop in diastolic readings in just eight weeks.\(^14\)

The suggested daily serving of two 500 mg vegetarian capsules of Olive Leaf Vascular Support supplies optimal concentrations of this proprietary, highly stable oleuropein, for maximum benefit.

CAUTION: Consult your healthcare provider before taking this product if you are being prescribed anti-hypertensive medication.

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.
Overstressed? Losing sleep?
Left unchecked, the inner turmoil created by these issues can lead to heart palpitations, muscle weakness, headaches, and even increased blood pressure. You need to take action to halt these symptoms immediately.

Fortunately, Life Extension® has created Natural Stress Relief, a calming formula made with lemon balm and L-theanine, two ingredients clinically proven to help promote sleep and relaxation.¹

The Cyracos® lemon balm extract used in this product is prepared from a special lemon balm chosen for its high concentrations of hydroxycinnamic and rosmarinic acids. These potent constituents may be mood enhancers that relieve everyday stress and alleviate sleep problems.¹

L-theanine, an amino acid derived from green tea, is a natural relaxant that has been used by the Japanese for years. Those who have taken L-theanine compare it to a massage, meditation session, and aromatherapy rolled into one.²

Based on a tremendous amount of published data, Life Extension® combined these two ingredients with the idea of providing the ultimate calming experience. Try it today.

Each vegetarian capsule of Natural Stress Relief provides:

- 300 mg of Cyracos® lemon balm extract
- 200 mg of Suntheanine® L-Theanine

Note that the amount of L-theanine in this product is double that of most L-theanine stand-alone supplements. The reason for this potency increase is reports of greater benefit when at least 200 mg of L-theanine are taken.

The retail price of a 30-count bottle of Natural Stress Relief is $28. If a member buys four bottles, the price of this potent stress-relieving formula is reduced to just $18 per bottle.

BEWARE OF IMITATIONS The L-theanine used in the new Natural Stress Relief is Suntheanine®, the only pure form of L-theanine available worldwide and the only form protected by 40 internationally recognized patents and scientifically proven in clinical studies to be safe and efficacious. Independent laboratory analysis has verified that certain other products on the market claiming to contain “L-theanine” are only half L-theanine, the other half being a different form of theanine known as “D-theanine” that has not been scientifically evaluated in published studies. Suntheanine® is a registered trademark of Taiyo International, Inc. Use of Suntheanine® is protected by US Trademark Registration No. 2,548,957. Cyracos® is a registered trademark of Naturex, Inc.

References:

Contains rice.

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.
Powerful Protection Against CELLULAR AGING
Conclusive evidence now indicates that PQQ (pyrroloquinoline quinone) activates cell signaling pathways that have the potential to reverse cellular aging!1

PQQ has previously been shown to promote growth of new mitochondria within aging cells,1-3 up-regulate cellular metabolism,1,2 protect neurons,4-7 and repair DNA!1,8

These and other synergistic signaling effects have the combined ability to promote longevity at the critical subcellular level.

PQQ has been found in all plant species ever tested. Scientists have gone so far as to state that PQQ may be “vital to life.”3 > >
Power-Boost Cell Signaling Activity!

An Essential Anti-Aging Nutrient

Scientists have found that PQQ, a critical coenzyme, plays a leading role in boosting critical cell signaling mechanisms. These signaling pathways regulate a variety of physiological and molecular processes throughout the body—processes that have an impact on key biomarkers of aging, such as mitochondrial function and cellular defense against oxidative stress.

PQQ and Cell Signaling

How can PQQ target multiple aging factors? The answer lies in the potent and unique capacity of PQQ to activate cell signaling pathways, especially those directly involved in cellular energy metabolism.

Also, similar to the action of CoQ10, PQQ actively participates in the energy transfer within the mitochondria that supplies the body with most of its bioenergy.

PQQ can even trigger spontaneous mitochondrial biogenesis—the creation of fresh, new mitochondria!

Specific cell signaling molecules have been found to be directly activated by PQQ.

Through these effects, the cell signaling power of PQQ targets aging at both the cellular and subcellular levels.

New research confirm that humans can obtain these multiple benefits after even just short-term supplementation.

A wealth of studies now confirm that PQQ’s cell-signaling activity translates into substantial protection against degenerative and age-related conditions, such as mitochondrial dysfunction, heart degeneration, brain injury, and cognitive decline. As one example, research shows that 20 mg of PQQ daily may reverse age-related cognitive decline in aging humans!

Since PQQ cannot be synthesized by your body it is necessary to obtain PQQ from outside sources. Fortunately, compared to other plant compounds, PQQ has greater solubility and bioavailability. PQQ is water-soluble and therefore, more easily absorbed at low supplemental intakes.

Let’s take a look at the modes of action behind PQQ’s multiple effects.

Cell Signaling Pathways

Early studies revealed that animals deprived of PQQ exhibit signs of accelerated aging in the form of elevated plasma glucose concentrations, impaired oxygen metabolism, stunted growth, compromised immunity, impaired reproductive capability, reduced numbers and survival rate of offspring, and a decrease in energy-producing mitochondria in their tissue.
Reintroducing PQQ to their diet reversed these effects, increasing mitochondrial numbers and restoring systemic function.46-48

PQQ is now linked to favorable effects on cell development, metabolism, and mitochondrial biogenesis. It provides the potential to reverse cellular aging and age-related disease by:

- Stimulating spontaneous growth of new mitochondria within aging cells.1
- Regulating gene expression.3
- Promoting tumor cell death from apoptosis.49
- Supporting mitochondrial protection and repair.1
- Providing powerful antioxidant support to mitochondria and other body molecules—with up to 5,000 times the effect of other antioxidants,4 and protecting the brain’s cells and neurotransmitter systems against neurotoxicity4,39,50 and amyloid-beta protein.46

The end result of PQQ’s activity is subcellular anti-aging and enhanced longevity.

(For more on these beneficial pathways, see box on previous page titled, ‘PQQ and Cell Signaling.’)

**Heart Benefits**

PQQ’s cell signaling activities produce measurable health improvements, especially cardio-protective and neuro-protective benefits.

For example, research with animals found that supplementation with PQQ decreased the size of the area of the heart injured by acute coronary artery blockage. This protective effect was found whether PQQ was given before or after the event—suggesting taking PQQ within the first hours following a cardiac event could deliver invaluable benefit to patients.18

Following up on this research, scientists then tested both PQQ and the common post-heart-attack treatment metoprolol (Lopressor®). They found that, while both reduced the size of the damaged area, there was a greater increase in mitochondrial energy-producing functions with PQQ.

And only PQQ lowered lipid peroxidation!19

The study team concluded that “PQQ is superior to metoprolol in protecting mitochondria from ischemia/reperfusion oxidative damage.”19

These same scientists found in later animal research, that “PQQ reduces oxidative stress, mitochondrial dysfunction, and cell death” in cardiac muscle cells.20

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**PQQ: Powerful Protection Against Cellular Aging**

- Pyrroloquinoline quinone (PQQ) activates a number of vital, cell signaling pathways involved in protecting against cellular aging!
- PQQ-powered signaling mechanisms create fresh mitochondria,1,2 upregulate cellular metabolism,1,2 improve cognitive performance and protect neurons,4,7 and repair DNA damage18
- These synergistic effects deliver substantial, subcellular anti-aging and enhanced longevity.
- Evidenced by studies verifying its wide cardioprotective and neuroprotective effects, PQQ beneficially modulates a host of key biomolecular functions!
Brain Effects

Scientists found in pre-clinical trials that PQQ reversed cognitive impairment caused by oxidative stress and improved performance on memory tests.\textsuperscript{21} PQQ was shown to protect against a pathologic gene protein associated with Parkinson’s disease.\textsuperscript{22} Much of the long-term neurological damage that arises after a stroke or spinal cord injury is caused by reactive nitrogen species which impose severe stresses on damaged neurons. However, PQQ was found to suppress reactive nitrogen species in induced strokes.\textsuperscript{24}

PQQ also blocked a source of reactive nitrogen species following spinal cord injury.\textsuperscript{25} Researchers concluded that PQQ significantly reduces the size of the damaged area of the brain even if administered 3 hours after the stroke.\textsuperscript{27} Additionally, it provides potent protection against the inflammation and oxidative damage that results from the sudden return of blood and nutrients to tissues deprived of them by stroke.\textsuperscript{26}

It would seem that PQQ should become a standard nutrient in the hospital emergency room setting for rapid administration to stroke victims.

Illustrating its cell signaling mechanism, PQQ protects neurons by modifying a key receptor site within our brain’s neurotransmitter system.\textsuperscript{28,29} This inhibits excitotoxicity, a response to long-term over-stimulation of neurons that is associated with many neurodegenerative diseases and seizures.\textsuperscript{30-32}

PQQ and Mitochondrial Biogenesis

Greater mitochondrial damage has been found in brain cells of humans over 70 relative to those in their early 40s. Many scientists believe mitochondrial longevity and the number of functioning mitochondria determine overall human longevity.\textsuperscript{51-53}

The coenzyme PQQ, has been shown to induce mitochondrial biogenesis—the growth of new mitochondria in aging cells.

While coenzyme Q10, or CoQ10, optimizes the function of mitochondria, PQQ activates genes that govern mitochondrial reproduction, protection, and repair.

To date, the only ways known to reliably stimulate mitochondrial biogenesis have been sustained calorie restriction or strenuous physical activity—potentially too rigorous for aging individuals.

With its power to safely trigger mitochondrial biogenesis, PQQ represents an extraordinary advance in the quest to reverse cellular aging.

PQQ was shown to block neurotoxicity induced by other toxins, including mercury, a factor suspected to play a role in the development of Alzheimer’s disease.\textsuperscript{5,33}

Accumulating research indicates that PQQ serves as an intervention in Alzheimer’s and Parkinson’s disease—blocking development, and oxidative effects, of both the amyloid beta protein associated with Alzheimer’s and the alpha-synuclein protein associated with Parkinson’s, before they can cause damage.\textsuperscript{34-37}

PQQ has been observed to deliver substantial cognitive benefits, including improved memory and attention.\textsuperscript{9,38} It activates the manufacture and release of an important, neuroprotective, nerve growth factor.\textsuperscript{38} Scientists tested PQQ’s cognitive effects in a double-blind, placebo-controlled clinical trial conducted on humans. In this study of healthy individuals ranging from 45 to 65 years of age, 20 mg a day of PQQ produced clear improvements on standard tests of greater cognitive function. Also, the PQQ test group scored two-fold higher on memory tests than the control group.\textsuperscript{9}
Scores were dramatically higher for a third group that received 300 mg per day of CoQ10 along with their 20 mg of PQQ. This underscores the powerful cognitive benefits of supplementation with agents shown to be involved in mitochondrial energy production.9

**Summary**

Through its broad cell signaling activity, PQQ (pyrroloquinoline quinone) modulates the many pathways of aging!

Scientific findings indicate that PQQ-enhanced signaling stimulates mitochondrial biogenesis,1-3 boosts cellular metabolism,1 improves cognitive performance and protects neurotransmitters,4-7 and repairs DNA.8

Together, these mechanisms support subcellular anti-aging and promote longevity.

Studies have shown that PQQ beneficially modulates biomolecular functions that result in substantial heart and brain defense. As one example, scientists found that PQQ helped produce remarkable reversal of cognitive decline in aging humans.9

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

**References**


**POQ and Gene Expression**

Recent rodent research on gene expression has shown that an induced deficiency of the coenzyme pyrroloquinoline quinone, or PQQ, results in an altering of the expression of a total of 438 genes.44 When the diet is then supplemented with PQQ, the genetic expression pattern reverts to normal. On investigation, the genes most affected by PQQ turned out to be those responsible for:58

- Cell signaling
- Cellular stress
- Growth of new mitochondria
- MAP kinase pathways (cell-surface-to-nucleus signaling proteins)
- Transport of metabolites

These findings shed light on PQQ’s genetic involvement with cell signaling, antioxidant activity, and mitochondrial biogenesis.
Degradation of mitochondrial DNA leads to mitochondria senescence and death—and extinction of the “host” organism.

As the power generators responsible for almost all bioenergetic production, mitochondria are the site of enormous oxidative activity. A nearly incalculable number of electrons are constantly flowing within the mitochondria, throwing off an equally enormous number of free radicals.

As a result, mitochondria are much more vulnerable to biochemical insults than other cellular structures.

And as scientists have discovered over the past several decades, mitochondrial DNA—relative to genetic DNA in the cell’s nucleus (nuclear DNA)—possesses few defenses against free radical damage.\textsuperscript{55,56} Nuclear DNA is protected by numerous guardian proteins—histones and repair enzymes—that blunt the impact of free radicals. Similar repair systems do not exist to protect mitochondrial DNA.\textsuperscript{55-57}

Also, nuclear DNA is housed within a protective double-membrane that separates it from the rest of the cell. This double-membrane is complemented by a dense matrix of filament proteins called the nuclear lamina, a kind of hard shell casing to further buffer DNA from external impacts.

By comparison, mitochondrial DNA is left almost entirely exposed. It is attached directly to the inner membrane where the mitochondria’s electrochemical furnace rages continuously, generating an enormous volume of toxic reactive oxygen species.

The mitochondria rank among the physiological structures most vulnerable to destruction from oxidative damage.

And scientific studies link genetic mutation within the mitochondria to human aging.\textsuperscript{57-59}

PQQ’s formidable free radical-scavenging capacity furnishes the mitochondria with superior antioxidant protection.

As a bioactive coenzyme, PQQ supports optimal function within the mitochondria which is responsible for supplying the body with most of its bioenergy.\textsuperscript{60}

Unlike other antioxidant compounds, PQQ’s exceptional stability allows it to carry out thousands of these electron transfers without undergoing molecular breakdown.

In fact, PQQ is up to 5,000 times more efficient in sustaining antioxidant capacity than other common antioxidant compounds, such as ascorbic acid.\textsuperscript{4}


Life Extension® first introduced SAMe in 1997. Since then, researchers continue to discover impressive benefits of this versatile nutrient. Largely known for its effects on optimal mood, SAMe has also shown benefits for the liver, brain, and joints.

A recent study conducted at Harvard Medical School and Massachusetts General Hospital cited the impressive benefits of SAMe for mood elevation. A report published in Germany indicates that SAMe may help maintain healthy neurological function. The impressive results showed that:

- SAMe increased glutathione levels by 50% and glutathione enzyme activity by 115%.2
- SAMe decreased a measurement of free radical activity by 46%.2
- SAMe inhibited lipid peroxidation by 55% in culture.2

In addition to these findings, SAMe also improves brain cell methylation, thereby facilitating youthful DNA enzymatic actions (which may help account for SAMe's mood-elevating properties). These enzymatic reactions are required for the healthy conversion of neurotransmitters such as serotonin and dopamine.

The good news is that SAMe prices continue to plummet. Compared to when SAMe was first introduced to the United States in 1997, Life Extension members can now obtain it for 78% less. On an inflation-adjusted basis, the savings are even greater.

A box of 20 400 mg SAMe tablets retails for $28. When a member buys six boxes, the price is reduced to only $18—a savings of 40%!

(SAME is also available in bottles containing 50 400 mg tablets. Retail price is $66. If a member buys four bottles, the price is reduced to $45 per bottle.) (Item # 01055)

References

*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.

CAUTION: SAMe should not be taken by those diagnosed with bipolar disorder.
The Next-Generation Pomegranate Formula

Life Extension® offers an advanced, cutting-edge pomegranate formula that brings together novel phytonutrients for the first time in a unique, high-potency blend.

**Full-Spectrum Pomegranate™** combines standardized extracts from the **whole fruit and flower**, along with pomegranate **seed oil**, to support system-wide health. In addition to the highly absorbable antioxidant powerhouses found in pomegranate fruit,2-4 **Full-Spectrum Pomegranate™** augments these polyphenols with newly discovered biologically **active compounds** from other parts of the pomegranate plant.

These little-known nutrients include: **punicanolic acid**, a member of the triterpene family of essential oils that provides cellular support to help with inflammation,5 and **pomegranate**, to combat age-related metabolic changes.6

This superior formula supplies the **complete** nutritional profile of the pomegranate plant. Just one softgel of **Full-Spectrum Pomegranate™** provides polyphenols equivalent to 12.3 ounces of pomegranate juice concentrate (or 30 pomegranates) plus a proprietary blend of **seed oil** and **flower extract**.

One softgel of **Full-Spectrum Pomegranate™** contains:

**POMELLA® Pomegranate** .......................................... 400 mg
(Punica granatum) Extract (fruit) [std. to 30% punicalagins (120 mg)]

**PomComplete™ Pomegranate** ............................... 137.5 mg
(Punica granatum) Blend [flower extract and seed oil (standardized to 22% (30 mg) puninic acid)]

**Full-Spectrum Pomegranate™**

A bottle containing 30 softgels of **Full-Spectrum Pomegranate™** retails for $24. If a member buys four bottles, the price is reduced to just **$15.75** per bottle. **Item # 01423**

Contains soybeans.

References:

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.
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.

Back in 1983, Life Extension® was the first to introduce CoQ10 as a proven method to enhance mitochondrial energy production.

CoQ10 has since gained universal recognition for its role in supporting cellular performance throughout the body.¹⁶

In an unprecedented breakthrough, a compound called PQQ (pyrrolo-quinoline quinone) has been shown to support mitochondrial biogenesis—the spontaneous generation of new mitochondria in aging cells.⁷

PQQ is available as a low-cost dietary supplement.

Mitochondria are cellular energy generators that supply virtually all the power your body requires for a healthy life span. An abundance of published studies underscores the critical importance of the mitochondria to overall health, especially as we age.¹⁵⁻¹⁴ Energy-intensive organs like the heart and brain are dense with mitochondria.

Until recently, the only natural ways for aging individuals to increase the number of mitochondria in their bodies were long-term calorie restriction or exhaustive physical activity—which are difficult or impractical for most people to implement.

PQQ offers a viable alternative.
Vital Protection for the Aging Heart and Brain

PQQ is an essential nutrient, meaning your body cannot make it on its own. A growing body of research indicates that PQQ’s unique nutritional profile supports heart health and cognitive function—alone and in combination with CoQ10. This comes as no surprise, given how much energy these vital organs need.

Research shows that PQQ supports heart cell function in the presence of free radicals and promotes blood flow in heart muscle.

When taken in combination with CoQ10, just 20 mg per day of PQQ has been shown to promote memory, attention, and cognition in maturing individuals.

A Breakthrough Weapon in the Battle Against Aging

Life Extension® has identified a purified, highly potent form of PQQ from Japan that is produced through a unique fermentation process. The result is the highest quality PQQ available on the market today called BioPQQ™.

A bottle containing 30 20 mg vegetarian capsules of PQQ Caps with BioPQQ™ retails for $39. If a member buys four bottles, the price is reduced to just $27 per bottle.

BioPQQ™ is a trademark of MGC (Japan).

References

To order PQQ Caps with BioPQQ™ standalone or any other PQQ-containing formula call 1-800-544-4440 or visit www.LifeExtension.com

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.
GLUCOSE CONTROL CAN BE EASY
Keeping blood sugar levels in check can be much easier if you eat the right foods. The trouble is that many people are accustomed to eating foods that can send blood glucose levels soaring. So the biggest glucose-control challenge may be simply remembering which foods help control glucose and which ones don’t. Keep in mind that the benefits of learning about glucose-controlling foods and remembering them may save your life. High glucose levels increase risk of cancer,1 cardiovascular disease,2 Alzheimer’s disease,3 and death.4

What’s really fun is discovering delicious new foods and recipes that keep glucose low. As people move away from foods flavored with sugar, salt, and fat, they enjoy what they eat more than ever: They taste the foods’ natural flavors. They love the increased energy they have, too. They are more productive and have more fun—rather than feeling tired and not wanting to do much. > >
Foods to Choose and Foods to Lose

You'll want to become familiar with the Glycemic Index (GI), which ranks carbohydrate-rich foods for their effect on blood glucose. While not infallible, it is an excellent guide for beginners to find the likely effect of their favorite foods on blood glucose.

Foods to avoid include those rich in easily digested starches or sugars, such as:

- Dates
- White bread and whole grain bread
- Watermelon
- White potatoes
- Most grains—including rice, millet, and oats
- Sugar in any form—for example: honey, brown sugar, agave, and molasses
- Standard pastas, made of flour—no matter what they are flavored with
- Corn
- Chips
- Pancakes and waffles
- Rice cakes
- Most fruit juices—except lemon, lime, or grapefruit juice
- Pizza

Foods to Choose and Foods to Lose

Hundreds of delicious low GI foods await you: Most berries, beans, non-starchy vegetables (kale, collards, bok choy, broccoli, squash, tomatoes, etc.) and nuts work well. If you want to eat meat or fish—choose low fat, high-quality meat and fish that are from non-polluted waters and are high in omega-3s.

Understanding Labels is a Key

When selecting a food to include in your healthful low GI diet, don't be fooled by labels. Some marketers will try to make you think a food is good for glucose control when it isn’t at all. Food with “Low CALORIE” or “No SUGAR” on the label may still be loaded with high GI starch that will send glucose skyrocketing. Remember: Starch often has as much effect on blood glucose as sugar itself, so always look at the amount of total carbohydrates rather than only total sugars.

If a food has more than 16 grams of total carbohydrate per serving, be cautious—especially if it is a juice, which is extremely easily digested.

Besides sugar as a listed ingredient, look for the words in the following chart:

They are sugar in disguise.

<table>
<thead>
<tr>
<th>Agave nectar</th>
<th>Barley malt syrup</th>
<th>Barley malt</th>
<th>Beet sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown sugar</td>
<td>Buttered syrup</td>
<td>Cane juice</td>
<td>Cane juice crystals</td>
</tr>
<tr>
<td>Caramel</td>
<td>Carob syrup</td>
<td>Corn sweetener</td>
<td>Corn syrup, or corn syrup solids</td>
</tr>
<tr>
<td>Date sugar</td>
<td>Dehydrated cane Juice</td>
<td>Dextrose</td>
<td>Diastatic malt</td>
</tr>
<tr>
<td>Ethyl maltol</td>
<td>Fructose</td>
<td>Fruit juice</td>
<td>Fruit juice concentrate</td>
</tr>
<tr>
<td>Glucose solids</td>
<td>Golden sugar</td>
<td>Golden syrup</td>
<td>Grape sugar</td>
</tr>
<tr>
<td>Glucose</td>
<td>High-fructose corn syrup</td>
<td>Honey</td>
<td>Invert sugar</td>
</tr>
<tr>
<td>Lactose</td>
<td>Maltodextrin</td>
<td>Malt syrup</td>
<td>Maltose</td>
</tr>
<tr>
<td>Mannitol</td>
<td>Maple syrup</td>
<td>Molasses</td>
<td>Raw sugar</td>
</tr>
<tr>
<td>Refiner’s syrup</td>
<td>Rice syrup</td>
<td>Saccharose</td>
<td>Sorbitol</td>
</tr>
<tr>
<td>Sorghum or sorghum syrup</td>
<td>Sucrose</td>
<td>Sugar</td>
<td>Syrup</td>
</tr>
<tr>
<td>Treacle</td>
<td>Turbinado sugar</td>
<td>Xylose</td>
<td>Yellow sugar</td>
</tr>
</tbody>
</table>
And while it’s true that some of them—like fructose and high fructose corn syrup—won’t raise your blood glucose as much as sucrose (table sugar), they may have even worse effects.5,6

**Tricky Labels**

Here is an example of how phrases on labels can trick you.

**“GOOD-FOR-YOU CEREAL”**
**ENDORSED BY MOMS OF THE HEALTHIEST KIDS**
**JUST TWO GRAMS OF FAT!**
**LOW SUGAR!**
**ALL-NATURAL!**

**Overall tip:** Beware when ingredients are provided in such small print that only Superman could read it. That can mean they are trying to hide something.

Be wary when a product makes claims like “Good-for-You” in its name. This kind of statement is meant to influence your buying decision, not to inform you of its actual quality.

Many sly marketers create organizations that sound real, like the MOMS OF THE HEALTHIEST KIDS, when all the organization does (if it exists at all) is endorse whatever the company wants.

Low fat (just two grams) is not better than moderate heart-healthy fat—for your arteries or your glucose levels. Related to this: partially hydrogenated fat is a screaming red flag—the type of fat that your body can’t process and that will clog your arteries.

Look at the total carbohydrates—not only the total sugar.

Natural is not the be-all & end-all: Arsenic, after all, is found in nature! Healthful ingredients matter.
Regenerative Power of Calorie Restriction

- High glucose levels increase risk of cancer, cardiovascular disease, Alzheimer’s disease, and death.
- The Glycemic Index (GI) ranks carbohydrate-rich foods for their effect on blood glucose and is a good way to start including foods that help support healthy blood glucose levels.
- Reading and understanding food labels is key—remember to watch for hidden sugars and starches.
- Aim for fasting glucose levels in the 80s or below and postprandial levels not more than 120 mg/dL measured two hours after eating.
- If lengthening your life span isn’t enough, gaining control of your blood glucose levels can lead to increased cognitive and memory capabilities, better blood pressure control, fat loss, increased mental and physical energy, and even reversal of type 2 diabetes.
- The CR Way to Great Glucose Control CD and teleconference series can help you take control of your glucose levels and enjoy the regenerative benefits of calorie restriction today!

Knowing Your Glucose Levels

Knowing the effect of your food on your blood glucose levels is very important. To learn this, test your glucose level before and after a meal. That requires a glucometer, also known as a blood glucose meter. Don’t hesitate to check your blood glucose whenever you need to. Making sure that the food you eat keeps blood glucose low offers huge rewards. Well controlled glucose may activate your adult stem cells—helping to rejuvenate every organ in your body!

Aim for fasting glucose levels in the 80s or below and postprandial levels, measured two hours after eating, of not more than 120 mg/dL. If you have type 2 diabetes mellitus, you can aim for a fasting glucose goal of 100 mg/dL or below and a postprandial limit of 130 mg/dL.

If you are unsure about how a food will affect your blood glucose, use your glucometer to test the glucose-level effect of the food. Make sure to be scientific about it:

1. Test to determine your glucose level before eating.
2. Eat your test food.
3. Test again 30 minutes after you finish eating the food. If your glucose has risen more than 20 mg/dL (40 if you have diabetes), this food will hinder your glucose control efforts.

Making Glucose Testing Affordable

The most expensive aspect of glucose testing is the cost of test strips—the way glucose-testing-supply companies make money. When you visit your doctor, try to get a prescription for glucose testing. This is likely to reduce the cost of purchase. You can take the prescription to your local pharmacy and in many cases redeem it for a free blood glucose meter so you can get started at no cost. You can also ask if your doctor will give you some of the samples that pharmaceutical reps provide.

Another way to get started for free is to check to see which of the big diabetes companies offer free getting-started kits. They will then give you the glucometer, hoping you will buy their test strips. Keep in mind that the cheapest isn’t always best. Ask your doctor for a glucose-testing-system recommendation.
Great Glucose Control Can Be Easy

The importance of glucose control drove the development of The CR Way to Great Glucose Control Program. It includes a 5-part CD and live teleconferences, where the practical application of glucose control is presented by glucose control experts—Paul McGlothin and Meredith Averill. Plenty of time for your questions to be answered is integrated into each conference.

This hands-on CR Way program provides two sets of glucose control meal plans:

**The Optimal Health Plan**

For those without diabetes, who want to control glucose for optimal health: Increased cognition, disease prevention, and—ultimately—more energetic, healthier living are emphasized.

**The Reversing Type 2 Diabetes Plan**

Scientific evidence shows that type 2 diabetes may be both preventable and reversible with a CR Way-based diet. This plan offers foods and recipes that can help lower blood glucose for those who have special glucose control issues.

**Lower Glucose: Better Life**

When you decide to follow a low GI, CR Way lifestyle, get ready for increased mental and physical capabilities. And watch out for the likely side effects of extra BDNF, a brain-improving molecule that will make you happy—possibly even giddy—and improve your learning speed and memory. Other beneficial molecules will probably kick in too with another host of benefits, such as lower blood pressure and loss of extra fat. Your new, energetic lifestyle will make it easier to do the things you want to do, and research indicates you will likely live longer.

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

**References**

Scientists have identified multiple mechanisms by which green tea extract helps protect against LDL oxidation, neuronal oxidation, and a host of other structural and functional age-related changes. LIFE EXTENSION MIX™ provides more green tea extract than found in commercial formulations.

**Broccoli** is one of the vegetables best documented to protect healthy DNA. The broccoli concentrate in LIFE EXTENSION MIX™ is standardized to provide sulforaphane and other glucosinolates, compounds responsible for broccoli’s protective benefits.

Olive polyphenols help protect against LDL oxidation, quench free radicals, and stabilize cell membranes. LIFE EXTENSION MIX™ contains an olive extract standardized to provide the best-documented polyphenol called hydroxytyrosol.

**Luteolin** is a flavonoid found in parsley, artichoke, basil, celery, and other foods. It has shown the ability to help protect against DNA oxidative damage. When measured against 27 other citrus flavonoids, luteolin showed one of the most beneficial effects at maintaining healthy DNA. Luteolin also suppresses excess levels of interleukin-6 and interleukin-1β. LIFE EXTENSION MIX™ contains a standardized dose of 8 mg of luteolin.

Lycopene is the red carotenoid in tomatoes that supports a healthy prostate and helps promote healthy lipid profiles for those already within a normal range.

D-glucarate is found in grapefruit, apples, oranges, broccoli, and Brussels sprouts. D-glucarate supports a detoxification process that helps to remove DNA toxins.

Pomegranate may be the most effective plant to help maintain optimal endothelial function. This pomegranate extract is standardized to provide the punicalagins and other polyphenols found in up to 2.6 ounces of pomegranate juice.

Sesame lignans increase tissue levels of vitamin E and gamma tocopherol, and inhibit the formation of an inflammatory precursor called arachidonic acid.

Wild blueberry extract, concentrated and standardized to help maintain optimal neuronal function.

**Pterostilbene** is a compound naturally found in blueberries and grapes that has been shown to have beneficial, anti-aging effects on gene expression and to promote healthy cognitive function.

Cyanidin-3-Glucoside is a berry compound that promotes healthy function of the retina to help support night vision.

Pyridoxal 5'-phosphate helps protect against glycation reactions, a toxic process in which sugars bind to lipids and proteins to form non-functional structures in the body.

<table>
<thead>
<tr>
<th>Vegetable-Fruit Complex</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green tea extract (decaf.) (45% EGCG)</td>
<td>325 mg</td>
</tr>
<tr>
<td>Broccoli sprout concentrate</td>
<td>525 mg</td>
</tr>
<tr>
<td>(providing sulforaphane, glucosinolates, D-3T, and PEITC)</td>
<td></td>
</tr>
<tr>
<td>Olive juice extract (providing hydroxytyrosol, oleuropein)</td>
<td>12.5 mg</td>
</tr>
<tr>
<td>Grapeseed proanthocyanidin extract (Leucoselect®)</td>
<td>25 mg</td>
</tr>
<tr>
<td>Grape (vitis vinifera) extract (BioVin®)</td>
<td>25 mg</td>
</tr>
<tr>
<td>Ginger extract (5% gingerols)</td>
<td>200 mg</td>
</tr>
<tr>
<td>Luteolin (Pureolin®)</td>
<td>8 mg</td>
</tr>
<tr>
<td>Lycopene (tomato extract) (Tomat-O-Red®)</td>
<td>3 mg</td>
</tr>
<tr>
<td>Lutein (marigold extract)</td>
<td>15 mg</td>
</tr>
<tr>
<td>(465 mcg trans-zeaxanthin)</td>
<td></td>
</tr>
<tr>
<td>Maqui Berry (Arístotelia chilensis) anthocyanin extract</td>
<td>100 mg</td>
</tr>
<tr>
<td>Milk thistle extract (85% silymarin)</td>
<td>100 mg</td>
</tr>
<tr>
<td>Bromelain</td>
<td>15 mg</td>
</tr>
<tr>
<td>Calcium D-Glucarate</td>
<td>200 mg</td>
</tr>
<tr>
<td>Citrus Bioflavonoids (50% hesperidin)</td>
<td>200 mg</td>
</tr>
<tr>
<td>Acerola extract 4:1</td>
<td>300 mg</td>
</tr>
<tr>
<td>Bilberry extract (MirtoSelect®)</td>
<td>30 mg</td>
</tr>
<tr>
<td>Pomegranate extract (30% punicalagins) (POMELLA®)</td>
<td>85 mg</td>
</tr>
<tr>
<td>Sesame seed lignan extract</td>
<td>10 mg</td>
</tr>
<tr>
<td>Berry-fruit blend (HiActives®)</td>
<td>200 mg</td>
</tr>
<tr>
<td>(blackberry, blueberry, cranberry, elderberry, Persimmon, prune, and cherry)</td>
<td></td>
</tr>
<tr>
<td>Wild Blueberry (Vaccinium angustifolium)</td>
<td>150 mg</td>
</tr>
<tr>
<td>anthocyanin extract (fruit)</td>
<td></td>
</tr>
<tr>
<td>trans-Pterostilbene (from pure Pterospan® and SMART® pterostilbene)</td>
<td>0.5 mg</td>
</tr>
<tr>
<td>Cyanidin-3-Glucoside (C3G) (from blackcurrant extract)</td>
<td>1.25 mg</td>
</tr>
<tr>
<td>Tart Cherry (Prunus cerasus) proanthocyanidin extract</td>
<td>85 mg</td>
</tr>
</tbody>
</table>

**Water-Soluble Vitamins and Enzymatic Activators**

| Vitamin C as: ascorbic acid, calcium, magnesium & niacinamide ascorbates, ascorbyl palmitate, acerola extract | 2000 mg |
| Natural Folate (from lemon extract) | 400 mcg |
| Biotin | 3,000 mcg |
| Trimethylglycine (TMG) (from sugar beets) | 100 mg |
| Vitamin B1 (thiamine HCl) | 125 mg |
| Vitamin B2 (riboflavin) | 50 mg |
| Supplying: Riboflavin 5'-phosphate | 2 mg |
| Vitamin B3 (niacinamide and niacinamide ascorbate) | 117 mg |
| Vitamin B3 (niacin) | 73 mg |
| Vitamin B5 (l-calcium pantothenate) | 600 mg |
| Pantethine | 5 mg |
| Vitamin B6 (pyridoxine HCl) | 5 mg |
| Pyridoxal 5'-phosphate (vitamin B6) | 100 mg |
| Vitamin B12 (cyanocobalamin) | 252 mcg |
| Vitamin B12 (hydroxy cobalamin) | 252 mcg |
| Vitamin B12 (ion exchange resin) | 96 mcg |
| PABA (para-aminobenzoic acid) | 200 mg |

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.
The Most Complete Multivitamin Available Today — Now with Tart Cherry and Maqui Berry!

Published scientific studies document that people who eat the most fruits and vegetables have much lower incidences of health problems. Few people, however, consistently eat enough plant foods to protect against common age-related decline,¹,² and commercial multivitamins do not provide all of the vital plant components needed to maintain good health.

Life Extension Mix™ has been upgraded to include a rich source of anthocyanins from maqui berry and one rich source of proanthocyanidins, tart cherry. These potent plant-derived antioxidants promote cardiovascular wellness, support comfortable muscle and joint function, and support blood sugar levels already within a healthy range. The full daily dose of Life Extension Mix™ can be obtained for as little as $1.49 per day.

<table>
<thead>
<tr>
<th>Fat-Soluble Vitamins</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A (acetate)</td>
<td>5,000 IU</td>
<td></td>
</tr>
<tr>
<td>Vitamin D3 (cholecalciferol)</td>
<td>2,000 mg</td>
<td></td>
</tr>
<tr>
<td>Vitamin C (as calcium ascorbate, ascorbic acid, ascorbyl palmitate, magnesium ascorbate, niacinamide ascorbate, acerola extract)</td>
<td>2,000 mg</td>
<td></td>
</tr>
<tr>
<td>Ascorbyl palmitate (fat-soluble vitamin C)</td>
<td>250 mg</td>
<td></td>
</tr>
<tr>
<td>Vitamin E (natural a-alpha tocopheryl succinate)</td>
<td>100 IU</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amino Acid Complex</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N-acetyl-L-cysteine</td>
<td>600 mg</td>
<td></td>
</tr>
<tr>
<td>Taurine</td>
<td>200 mg</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral Complex</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Selenium (from Se-methyl L-selenocysteine)</td>
<td>100 mcg</td>
<td></td>
</tr>
<tr>
<td>Selenium (from L-selenomethionine—SelenoPure™)</td>
<td>50 mcg</td>
<td></td>
</tr>
<tr>
<td>Selenium (from sodium selenate)</td>
<td>50 mcg</td>
<td></td>
</tr>
<tr>
<td>Zinc (monomethionine) (OptiZinc®)</td>
<td>20 mg</td>
<td></td>
</tr>
<tr>
<td>Zinc (succinate)</td>
<td>15 mg</td>
<td></td>
</tr>
<tr>
<td>Boron (as boron citrate/aspartate/glycinate)</td>
<td>3 mg</td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>218 mg</td>
<td></td>
</tr>
<tr>
<td>Copper (as copper glycinate chelate TRAACS®)</td>
<td>1 mg</td>
<td></td>
</tr>
<tr>
<td>Chromium (as Crominex® 3+, chromium stabilized with Capros® and PrimaVie® Shilajit)</td>
<td>500 mg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cholinergic Complex</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Choline (from bitartrate)</td>
<td>120 mg</td>
<td></td>
</tr>
<tr>
<td>Phosphatidylcholine (from soy)</td>
<td>150 mg</td>
<td></td>
</tr>
<tr>
<td>Inositol</td>
<td>250 mg</td>
<td></td>
</tr>
</tbody>
</table>

**Vitamin D3** helps maintain healthy bone density and DNA. There is five times more vitamin D in LIFE EXTENSION MIX™ compared to conventional multivitamins.

LIFE EXTENSION MIX™ contains only the expensive dry powder form of vitamin E. This natural form of vitamin E (succinate) has been shown to promote healthy DNA better than other forms.

**N-acetyl-L-cysteine** suppresses free radicals inside the cells and maintains healthy glutathione levels. Taurine may protect against free radicals between cells and supports eye health.

Some scientific evidence suggests that consumption of selenium may reduce the risk of certain forms of cancer; however, the FDA has determined that this evidence is limited and not conclusive.

**Zinc** is often poorly absorbed, but LIFE EXTENSION MIX™ provides two of the most bioavailable forms of zinc.

**Boron** is not only needed to maintain healthy bone density but may also help promote healthy prostate cell function.

LIFE EXTENSION MIX™ provides a high amount of chromium to help maintain arterial wall structure and already normal glucose levels. We have upgraded our chromium-containing products with Crominex® 3+, a highly stable and biologically active form of chromium blended with Capros® and PrimaVie®.

**Magnesium** helps protect arteries and heart valves, and supports heart and brain cells. LIFE EXTENSION MIX™ provides high potencies of six different forms of magnesium to fully saturate the body with this life-saving mineral.

Maintaining high levels of acetylcholine in the brain helps support cognitive function and memory.

¹ Betatene® is a registered trademark of Cognis Nutrition and Health. ² The use of Calcium D-Glucarate is licensed from Applied Food Sciences, LLC under U.S. Patent No. 5,561,160. ³ OptiZinc® is a registered trademark of InterHealth Nutritional, Inc. ⁴ SelenoPure™ is a trademark of Nutrition 21. ⁵ Crominex 3+, Capros® and PrimaVie® are registered trademarks of Nutreone, Inc. ⁶ Leucoselect® is a registered trademark of Indena S.p.A. ⁷ BioVite® is a registered trademark of Cyvex Nutrition. ⁸ Pannolin™ is a trademark of Pharma Science Nutrients, Inc., and is used here under license. All rights reserved worldwide. ⁹ Tomat-O-Red® is a registered trademark of lycOred Ltd. ¹⁰ POMELLA® Extract is covered under U.S. Patent 7,638,640 and POMELLA® is a registered trademark of Verdeur Sciences, Inc. ¹¹ Prieropan™ and SMART™ are trademarks of Pharma Science Nutrients, Inc., and are used here under license. ¹² MirtilSelen® is a registered trademark of Indena, S.p.A., Milan, Italy. ¹³ HiActivs® is a registered trademark of VOF FutureCeuticals, Inc. ¹⁴ TRAACS® is a registered trademark of Albon Laboratories, Inc.

CAUTION: Some people choose a high-niacin version of Life Extension Mix that provides 862 mg in the daily dose, of which 345 mg is the form of niacin that can cause temporary flushing, itching or gastric disturbances. Liver function testing is recommended when niacin is taken in excess of 50 mg daily. Those with gout or liver diseases should avoid taking high doses of niacin. Consult with your doctor before using this product if you are taking anticoagulant medications. Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxyvitamin D measurement. Vitamin D supplementation is not recommended for individuals with hypercalcemia (high blood calcium levels). Contains soybeans, corn, rice, and sesame.

**References:**

To order call toll-free 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.
NATURAL APPROACHES FOR OPTIMAL GLUCOSE CONTROL

Standardized chlorogenic acid supplements taken before meals can help many people achieve optimal glucose control.

Life Extension® offers a variety of nutrient blends rich in green coffee bean extract that provide potent doses of chlorogenic acid.

CoffeeGenic™ Green Coffee Extract with Glucose Control Complex

CoffeeGenic™ Green Coffee Extract with Glucose Control Complex contains 200 mg of CoffeeGenic™ Green Coffee Extract along with 4 ingredients formulated to help support healthy blood glucose levels already within normal range. Take one capsule 20-30 minutes before each meal to obtain the following nutrients in addition to Green Coffee Bean extract:

Each vegetarian capsule of CoffeeGenic™ Green Coffee Extract with Glucose Control Complex provides:

- CoffeeGenic™ Green Coffee (Coffea arabica) Extract (bean) 200 mg (std to 50% Chlorogenic acid (100 mg))
- Iodine 25 mcg (typical value naturally occurring from Ascophyllum nodosum and Fucus vesiculosus)
- Chromium 150 mcg (as Crominox® 3+ chromium stabilized with Capros® (Phyllanthus emblica) Extract (fruit) and PrimaVie® Shilajit)
- InSea²® [proprietary composition of demineralized polyphenols from brown seaweeds Kelp (Ascophyllum nodosum) and Bladderwrack (Fucus vesiculosus)] 125 mg
- Integra-Lean® African Mango (Irvingia gabonensis) proprietary Extract (seed) 100 mg
- Green Tea (Camellia sinensis) Decaffeinated Extract (leaf) 100 mg (std. to 98% polyphenols by UV (98 mg), 45% EGCG by HPLC (45 mg))

CoffeeGenic™ Green Coffee Extract

CoffeeGenic™ Green Coffee Extract is produced through a patented extraction process to deliver an extraordinarily high proportion of chlorogenic acid for maximum potency. The coffee beans sourced for CoffeeGenic™ Green Coffee Extract are organically grown. For those who want to take CoffeeGenic as a standalone, it is available in 200 mg and 400 mg potencies.

One vegetarian capsule of CoffeeGenic™ Green Coffee Extract should be taken before heavy meals. This Green Coffee Extract is standardized to 50% chlorogenic acid.

- CoffeeGenic™ Green Coffee Extract (200 mg) • Item # 01604 (Each serving contains approximately 6 mg caffeine)
  
  A bottle containing 90 200 mg vegetarian capsules of CoffeeGenic™ Green Coffee Extract retails for $25. If a member buys four bottles, the price is reduced to just $16.50 per bottle.

- CoffeeGenic™ Green Coffee Extract (400 mg) • Item # 01620 (Each serving contains approximately 12 mg caffeine)
  
  A bottle containing 90 400 mg vegetarian capsules of CoffeeGenic™ Green Coffee Extract retails for $38. If a member buys four bottles, the price is reduced to just $25.50 per bottle. Those seeking to emulate the dose used in the 2012 study that induced an average 17.6 pounds of weight loss’ should take one 400 mg capsule of standardized green coffee bean extract three times a day.

Caution: Because this product may lower blood glucose, consult your healthcare provider before taking this product if you are taking blood glucose lowering medication.

To order any of the Green Coffee Extract formulas, call 1-800-544-4440 or visit www.LifeExtension.com

*This supplement should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.

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.
Don’t let high blood glucose shorten your life!

Join THE CR WAY TO GREAT GLUCOSE CONTROL, the adult education course that helps lower glucose.

The program starts when you receive the CR Way to Great Glucose Control CD, the beautiful 187-page, color-illustrated e-Book that you open, read, and save on your home computer. Enjoy delicious foods, recipes, and unique meal plans that provide glucose guidance for every hour of your day.

This is not like many books or CDs that are bought, put on the shelf, and never used. You’ll join two friendly classes via live teleconference with others who share your passion for healthful living. You never have to leave your home to receive caring guidance from experts, Paul McGlothin & Meredith Averill, who show you how delicious and easy low-glucose living can be.

Life is precious. Don’t risk the suffering that often results from high blood glucose: memory loss, heart disease, diabetes, cancer, Alzheimer’s disease, and—ultimately—shorter life span.

Item# 33840
Retail price $98
Member price $82

Take the first step to a better, longer life. Call 1-800-544-4440 or visit www.LifeExtension.com to sign up NOW for THE CR WAY TO GREAT GLUCOSE CONTROL.
Defend Against
DNA DESTRUCTION
As each second goes by, your DNA is being attacked by internal and environmental factors that can result in potentially lethal mutations.\textsuperscript{1}

This accumulated DNA damage underlies most of the conditions that kill us, such as atherosclerosis, cancer, and Alzheimer’s disease.\textsuperscript{2-5}

Fortunately, there are steps that you can take to protect your DNA from the onslaught of around-the-clock damage.

Scientists have demonstrated that a special group of plant compounds known as \textit{xanthophylls} have shown protective effects against DNA damage.\textsuperscript{6} These molecules have been researched for their ability to prevent DNA damage and reduce disease risk.

Xanthophylls have been shown to not only prevent deadly genomic damage but they simultaneously boost your body’s natural DNA repair mechanisms which help it recover from damage that’s already occurred.\textsuperscript{7,8} > >
Widespread Impact of DNA Damage

The DNA molecule is extremely vulnerable to injury from internal and external sources. Oxygen radicals, toxins, and even sunlight all induce breaks, nicks, and other injuries to the delicate DNA strands. Without knowing it, you experience millions of such DNA “accidents” each day. Fortunately, your body has no fewer than five interrelated mechanisms for repairing that damage. Those mechanisms are so efficient and accurate that your cells and tissues remain stable and disease-free year after year. Periodically, even the most efficient and accurate repair systems make small errors. And these errors add up. Scientists now recognize that the ability to identify and repair DNA damage is the leading discriminator of who does and does not get cancer and probably many of the other diseases of aging.

Xanthophylls Fight DNA Damage

Xanthophylls are concentrated in yellow, orange, and deep green leafy vegetables. Epidemiological studies show that people who consume large amounts of fruit and vegetables have lower rates of cancer and other DNA damage-related diseases. But studies that take a closer look show that supplying up to 8 servings of carotenoid-containing fruits and vegetables per day don’t demonstrate a reduction in DNA damage or improvement in repair mechanisms. Eating 12 servings per day did produce some benefit particularly with regards to reduction of damaging inflammatory molecules, but most people can’t sustain that level of vegetable consumption. True DNA protection seems to require supplementation to achieve higher levels of these valuable nutrients in your blood.

When human volunteers took capsules containing concentrated xanthophylls, they demonstrated a 40% reduction in markers of DNA damage in their white blood cells. Individually, lutein, zeaxanthin, and astaxanthin supplements each reduce oxidative stress and DNA destruction in both animal and human studies. Doses of 4 to 12 mg/day of xanthophylls, alone or in combination, have been reported to reduce DNA damage in various studies.

Let’s turn now to the compelling body of science that demonstrates how these three xanthophylls can work to prevent catastrophic age-related diseases such as cancer and eye disease by protecting DNA from damage.

Xanthophylls Prevent Cancer

Scientists estimate that poor nutrition and lifestyle habits may play a role in up to 80% of colon, breast, and prostate cancers and 33% of all other cancers, including inadequate intake of nutrients that prevent DNA damage and promote DNA repair. Large epidemiological studies consistently show that higher intake of foods rich in lutein, zeaxanthin, and astaxanthin reduce the risk of several different cancer types.

Laboratory studies reveal the reasons for this impressive protection. When tumors are experimentally implanted into mice supplemented with xanthophylls, the rate of tumor growth and the final size of the tumors are reduced by as much as 40%, compared with unsupplemented animals. The number of tumors triggered by exposure to a carcinogenic chemical can be reduced by 55% in animals supplemented with xanthophylls such as lutein. It takes supplemented animals significantly longer to develop those artificial cancers. How do the xanthophylls exert their powerful anticancer actions?
They do it through a number of mechanisms that strike at different targets throughout the cancer development process:

- They block cancer initiation by limiting DNA damage and strengthening DNA repair mechanisms.12,26
- They suppress genes that promote tumor growth after cancer initiation.34
- They turn on genes that suppress tumor promotion.30
- They reduce inflammation that can promote cancer growth and spread.33-35
- They switch on cancer cells’ defective suicide programming (apoptosis), helping to shrink existing cancers and prevent metastatic spread.30
- They slow the development of new blood vessels needed by a rapidly-growing tumor, starving it of its vital nutrient and oxygen supplies.30

Research has shown that supplementation with lutein, zeaxanthin, and astaxanthin boosts the immune system in ways that help it identify and destroy cancerous cells in their earliest stages.29,31 Most scientists

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**Defend Your DNA with Carotenoids**

- Damage to DNA, the universal blueprint for life, is a fundamental cause of aging and age-related chronic disease.
- DNA repair mechanisms begin to fail with advancing age, resulting in accumulation of damaged DNA throughout the body.
- Growing evidence implicates DNA damage and impaired repair mechanisms in the causation not only of cancer, but of the eye disease called age-related macular degeneration (AMD) as well.
- A special group of carotenoid nutrients, the xanthophylls, combat DNA damage and boost DNA repair mechanisms.
- Supplementation with the xanthophyll nutrients lutein, zeaxanthin, and astaxanthin may help to prevent or slow the development of cancer and other age-related disorders such as AMD.
today recognize that, after prevention of DNA damage, this kind of “immune-surveillance” is an essential and efficient means of preventing a full-blown cancer from emerging. The effects of the xanthophylls on skin cancer, the most common cancer in the United States, are especially prominent. Sunlight, and especially its ultraviolet rays, trigger high rates of DNA damage in skin cells that initiate certain types of skin cancer. Ultraviolet radiation weakens the immune system’s anti-cancer surveillance mechanisms. People with the highest intake of lutein and zeaxanthin have a 53% lower risk of developing skin cancer compared to those with the lowest intake levels. Studies show that supplementation with xanthophylls reduces skin’s unhealthy responses to ultraviolet light and enhances its resistance to cancer development. Increased survival time in an animal model of skin cancer has been demonstrated as a result of supplementation.

Interestingly, lutein, zeaxanthin, and astaxanthin supplements reduce light-induced skin aging, again in large part because of their ability to combat age-promoting DNA damage. Their unique molecular structure seems to make them especially potent at taming the destructive effects of light bombardment on vulnerable tissues. Nowhere is that protection more essential than in the retina of the eye, as we’ll see next.

Carotenoids Prevent AMD

Age-related macular degeneration, or AMD, produces more irreversible loss of vision than any other single cause. As we’ve seen, AMD is the result of constant assault on retinal cells by light energy, which damages their mitochondrial DNA. The retina is protected by cells packed with lutein, zeaxanthin, and meso-zeaxanthin (formed from lutein in the retina). These three nutrients produce light-absorbing characteristics that protect the light-sensing cells from damage.

But levels of these three nutrients in retinal tissue decline with age, as does their dietary intake, leaving your retina — and your vision — increasingly vulnerable to damage. DNA damage and repair are essential in understanding age-related macular degeneration. In this case, damage to DNA in mitochondria is the culprit. Mitochondria generate the power for all of our cells and they are especially important in tissues with high energy demands, such as the heart muscle, nerve tissue, and cells in the retina.

Macular degeneration may cause abnormal new blood vessels to grow under the retina and leak fluid and blood. This is one of the most common causes of decreased vision after age 60.
Mitochondrial DNA is highly vulnerable to damage both by light and by oxidant stress, and it has limited repair mechanisms. Unrepaired mitochondrial DNA damage causes those cells to become unstable, malfunction, and eventually die, leading to the loss of central vision we identify as age-related macular degeneration. And the more severe the DNA damage, the more advanced the damage to the retina in AMD.

You can replace your dwindling stores of retinal pigment, however, by raising your consumption of these xanthophyll nutrients.

Studies show that people with the highest intake of xanthophylls such as lutein, zeaxanthin, and astaxanthin are at 35% less risk of developing the most serious form of AMD, so-called “wet,” or neo-vascular disease. High xanthophyll intake provides up to a 55% reduction in risk of the less severe, but still disabling, “dry” form of AMD.

Unfortunately, you can't get enough of these protective xanthophylls from your diet alone. Supplementation at fairly high levels is required in order to restore protective levels of retinal pigment. Supplementation studies demonstrate two important and related outcomes of increased xanthophyll consumption. First, people who supplement with these nutrients develop greater concentrations of protective retinal pigments, resulting in improved light protection in their eyes, and lower risk for AMD. The ability to see visual contrast improves with xanthophyll supplementation, as does overall retinal sensitivity to visual images.

Xanthophyll supplementation produces objective improvements in the intensity of electrical impulses produced by the retina, a direct measure of increased visual functioning.

These improvements in retinal pigmentation and visual function have been seen with daily doses of...
lutein, 12 mg, and zeaxanthin, 1 mg, though 10 to 20 mg have been found to be safe daily doses of each nutrient.\textsuperscript{41,44,50,51,55} Studies using lower doses of lutein (up to 6 mg/day) generally fail to show any effect.\textsuperscript{52} Products containing free lutein, as opposed to lutein bound up to other molecules, appear to have superior effectiveness.\textsuperscript{55} You may be able to protect vital eye structures by supplementing with the omega-3 fatty acid DHA, 800 mg/day as well.\textsuperscript{41}

Big Pharma wants to sell expensive drugs that have only limited benefits (and many side effects) in managing AMD, but experts now agree that supplementation with xanthophylls is “a simple, cost-effective public health intervention that might help to decrease the incidence of AMD.”\textsuperscript{39}

**Summary**

Damage to DNA is increasingly being understood to underlie many age-related diseases; it may even be one of the primary causes of aging itself.

Prominent conditions in which we understand the role of DNA damage are cancer, and the eye disease called age-related macular degeneration (AMD). Seemingly disparate, these diseases share a common cause, and are showing encouraging signs of responding to a common nutritional supplement.

The xanthophyll molecules, lutein, zeaxanthin, and astaxanthin are powerful preventers of DNA damage. They stimulate DNA repair mechanisms, which fail with advancing age. Studies are showing that these nutrients may slow the development of cancer, and prevent the onset of eye disease. Safe even in high doses, the xanthophylls deserve a place in your age-prevention toolkit.

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**References**

DEFEND AGAINST DNA DESTRUCTION WITH CAROTENOIDS


High Potency FAT-SOLUBLE NUTRIENTS in ONE Softgel

Most people don’t get enough oil-based nutrients like vitamin K, lycopene, and gamma tocopherol. This problem is solved with a one-per-day softgel called Life Extension® Super Booster. It provides high potencies of fat-soluble compounds lacking in dry powder formulas, along with other nutrients.

Just one SUPER BOOSTER provides:

- VITAMIN K2: Scientific studies show vitamin K2 provides superior benefits for the bones, arteries, and other tissues. The MK-4 form of vitamin K2 is the most rapidly absorbed and is now routinely used in Japan to maintain healthy bone density. MK-4, however, only remains active in the blood for a few hours. The MK-7 form of K2, on the other hand, remains bioavailable to the human body over a sustained 24-hour period. Super Booster provides a potent dose of MK-7 and MK-4 to keep calcium in the bone and out of the arteries.

- GAMMA TOCOPHEROL: If one consumes only alpha tocopherol, the critically important gamma tocopherol is displaced from cells within the body. While alpha tocopherol vitamin E inhibits lipid peroxidation, the gamma tocopherol form quenches the dangerous peroxynitrite free radical. It is especially important for those who take vitamin E supplements to make sure they consume at least 200 mg a day of gamma tocopherol.

- LUTEIN: The carotenoid lutein helps maintain healthy cell division, supports the macula of the eye, and protects the endothelial lining of the arteries.

- LYCOPENE: Evidence suggests that people who ingest the carotenoid lycopene enjoy healthier prostate function. Lycopene also helps guard against LDL oxidation.

- GINKGO: Hundreds of studies substantiate the multifaceted effects of Ginkgo biloba in promoting healthy circulatory and neurological function.

- CHLOROPHYLLIN: Scientific studies indicate that chlorophyllin may protect against environmentally induced damage to DNA.

A bottle of 60 Super Booster softgels retails for $42. If a member buys four bottles, the price is reduced to just $28.50 per bottle.

The Super Booster saves consumers huge dollars by combining a wide variety of costly nutrients into one daily softgel. If you add up the price of the individual ingredients contained in the Super Booster, you would spend two to three times more for this potency if taken separately.

To order Super Booster, call 1-800-544-4440 or visit www.LifeExtension.com

Contains soybeans, corn and sesame.

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

Tomat-O-Red® is a registered trademark of LycoRed, Ltd.

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.
Falling down is responsible for 70% of accidental deaths in older people. Poor lighting conditions are often the culprit.
Fortunately, C3G derived from black currant extract supports eyesight in dark conditions by promoting the healthy function of delicate structures within the retina that support night vision.
Super Zeaxanthin contains a potent dose of C3G to nourish cells throughout the body.

Maintain Macular Density
The macular pigment is composed of lutein, zeaxanthin, and meso-zeaxanthin. The density of the macula is essential to proper vision. Macular density declines naturally over time.
Eating lots of lutein- and zeaxanthin-containing vegetables can help maintain the structural integrity of the macula. However, since meso-zeaxanthin is not part of the typical diet, it cannot be easily replaced. Young people convert lutein into meso-zeaxanthin inside their macula. Some aging people, however, lose their ability to convert lutein into meso-zeaxanthin.
The Super Zeaxanthin formula provides zeaxanthin, lutein and meso-zeaxanthin to help maintain macular density.

Combat “Eye Fatigue”
Staring at a fixed-distance object such as a computer screen for a long period of time can cause the muscles that focus your eyes (called the ciliary body) to tire or go into spasm. This can result in physical symptoms such as head discomfort, sensitivity to glare, tiredness, soreness, dryness, and blurry vision.

Enhanced Night Vision!

EYE PROTECTION FORMULA

Comprehensive Ocular Protection in One Daily Softgel
The Super Zeaxanthin formula provides ingredients that have been shown to promote healthy eyesight. Just one softgel of Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G provides:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>OptiLut®, Lutein Plus® and MZ®</td>
<td>38 mg</td>
</tr>
<tr>
<td>Marigold (Tagetes erecta) extract (flower) [free lutein equivalent 10 mg]</td>
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</tr>
<tr>
<td>Zeaxanthin &amp; Meso-zeaxanthin blend</td>
<td>3.75 mg</td>
</tr>
<tr>
<td>[micronized zeaxanthin, OptiLut®, Lutein Plus® and MZ® Marigold Extract (flower)]</td>
<td></td>
</tr>
<tr>
<td>NC3G (Cyanidin-3-glucoside)</td>
<td>2.2 mg</td>
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<tr>
<td>[from European black currant (Ribes nigrum) extract (fruit)]</td>
<td></td>
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The retail price for a bottle containing 60 softgels of Super Zeaxanthin with Lutein, Meso-zeaxanthin and C3G is $42. If a member buys four bottles, the price is reduced to just $28.50 per bottle.

References

OptiLut® is a registered trademark of NutriScience Innovations, LLC. LuteinPlus® and MZ® are registered trademarks of Nutriproducts Ltd., 7 Marfleet, CB22 5LA, UK, licensed under US Patents 6,218,436 & 6,329,432.

To order Super Zeaxanthin with Lutein, Meso-zeaxanthin and C3G, call 1-800-544-4440 or visit www.LifeExtension.com

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.
For decades, companies have sent samples of liquid fish oil supplements to Life Extension® that claimed to taste good. These were all rejected because they either tasted bad or had an unpleasant aftertaste.

Finally a method has been developed to make a sugar-free liquid fish oil that tastes great, and has no unpleasant aftertaste.

An abundance of scientific research suggests wide-ranging health dividends from the omega-3 fatty acids found in fish oil. Unfortunately, the typical, modern Western diet is still disproportionately high in the omega-6 family of fatty acids and low in healthy omega-3 fatty acids. 1, 2

For Life Extension® members who want another way to obtain the rich benefits of fish oils, there is now pleasantly natural flavored, easy to use, liquid omega-3 fish oil!

**Beyond Cardiovascular Health**

Decades of research and over 15,000 studies confirm the vital importance of the omega-3 fatty acids known as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).

Life Extension® members already know that the EPA and DHA found in fish oil provide substantial support for normal heart and brain health. 3, 9

But research has increasingly shown that the health-promoting effects of EPA and DHA may extend to an even larger range of benefits!

**Highly Refined Fish Oil Blend**

Life Extension® Omega-3 Highly Refined Fish Oil is a premium fish oil derived from sustainable small-species fish sources (anchovy, sardine and/or mackerel) harvested from the deep cold waters of Chile. Through careful molecular distillation and gentle processing, this fish oil is tested and found extremely low levels of environmental pollutants and safe for everyone in the family. These sensationally-flavored liquid fish oils are available in natural lemon or piña colada flavors.

Two tablespoons a day (1 ounce) of Life Extension® Omega-3 Highly Refined Fish Oil provide:

- **EPA** (eicosapentaenoic acid) 1,316 mg
- **DHA** (docosahexaenoic acid) 844 mg
- **Other omega-3 fatty acids** 540 mg
- **Total omega-3 fatty acids** 2,700 mg

A bottle containing 16 ounces of Life Extension® Omega-3 Lemon Whirl or Life Extension® Omega-3 Tropical Whirl retails for $24. If a member buys four bottles, the price is reduced to $16.50 per bottle. If a member buys four bottles of any combination of flavors, the price is reduced to $16.50 per bottle.

Supportive but not conclusive evidence shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease.

References

To order Life Extension® Omega-3 Lemon Whirl or Omega-3 Tropical Whirl, 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.
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*NO PURCHASE NECESSARY. LEGAL RESIDENTS OF THE 50 UNITED STATES 18 YEARS AND OLDER. VOID WHERE PROHIBITED.
STRONGER BONES, STRONGER YOU

Your bones are the skeletal foundation of your body. Keeping them strong is vital to maintaining optimal quality of life as you age. Life Extension® has formulated an exciting product made with chelated calcium and collagen called KoAct® to maintain bone strength and mineral density.

KoAct® allows for greater flexibility...so your bones can absorb energy, reducing the risk of age-related injuries. Additional plant extracts are included for their bone-protective minerals and polyphenols.

A bottle of Bone Strength Formula with KoAct® retails for $42. If a member buys four bottles, the price is reduced to $28.50 per bottle.

Contains corn.

If you need extra bone support, ask your healthcare professional how Bone Strength Formula with KoAct® can be part of a comprehensive nutritional program in conjunction with proper resistance exercise. Life Extension offers many mineral formulas that may complement Bone Strength Formula with KoAct® to ensure optimal mineral intake.

KoAct® is a registered trademark of AIDP, Inc. Fruitex B® and OsteoBoron® are registered trademarks of VDF FutureCeuticals, Inc., U.S. Patent #5,962,049.

To order Bone Strength Formula with KoAct®, call 1-800-544-4440 or visit www.LifeExtension.com

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 following interview with Dr. David Graham (senior drug safety researcher at the FDA) was conducted by Manette Loudon, the lead investigator for Dr. Gary Null. This interview contains jaw-dropping insights about the corruption and crimes that take place every day inside the Food and Drug Administration. This is no outside critic, either: these are the words from a top FDA employee who has worked at the agency for two decades. If you’ve ever wondered how the drug industry could pull off the greatest con of our time—and turn the human body into a profit-generating machine—you’re about to learn the shocking answers in this interview.

This interview is reprinted here with permission from Dr. Gary Null. What you may find particularly troubling is that this interview was conducted in 2005, yet little has changed within the FDA to correct these atrocities. > >
MANETTE: Dr. Graham, it’s truly a pleasure to have the opportunity to interview you. Let me begin by asking you how long you’ve been with the FDA and what your current position is?

DR. GRAHAM: I’ve been with the FDA for 20 years. I’m currently the Associate Director for Science and Medicine in the Office of Drug Safety. That’s my official job. But when I’m here today I’m speaking in my private capacity on my own time, and I do not represent the FDA. We can be pretty certain that the FDA would not agree with most of what I have to say. So with those disclaimers you know everything is okay.

MANETTE: On November 23, 2004 PBS Online News Hour Program you were quoted as making the following statement, “I would argue that the FDA, as currently configured, is incapable of protecting America against another Vioxx®. Simply put, FDA and the Center for Drug Evaluation Research (CDER) are broken.” Since you’ve made that statement, has anything changed within the FDA to fix what’s broken and, if not, how serious is the problem that we’re dealing with here?

DR. GRAHAM: Since November, when I appeared before the Senate Finance Committee and announced to the world that the FDA was incapable of protecting America from unsafe drugs or from another Vioxx®, very little has changed on the surface and substantively nothing has changed. The structural problems that exist within the FDA, where the people who approve the drugs are also the ones who oversee the post marketing regulation of the drug, remain unchanged. The people who approve a drug when they see that there is a safety problem with it are very reluctant to do anything about it because it will reflect badly on them. They continue to let the damage occur. America is just as at risk now, as it was in November, as it was two years ago, and as it was five years ago.

MANETTE: In that same PBS program, you were also quoted saying, “The organizational structure within the CDER is currently geared towards the review and approval of new drugs. When a serious safety issue arises at post marketing, the immediate reaction is almost always one of denial, rejection and heat. They approved the drugs, so there can’t possibly be anything wrong with it. This is an inherent conflict of interest.” Based on what you’re saying it appears that the FDA is responsible for protecting the interests of pharmaceutical companies and not the American people. Do you believe the FDA can protect the public from dangerous drugs?

MANETTE: When did that go into effect?

DR. GRAHAM: The Prescription Drug User Fee Act came into play in 1992. It was passed by Congress as a way of providing the FDA with more funds so that it could hire more physicians and other scientists to review drug applications so that drugs would be approved more quickly. For industry, every day a drug is held up from being marketed, represents a loss of one to two million dollars of profit. The incentive is to review and approve the drugs as quickly as possible, and not stand in the way of profit-making. The FDA cooperates with that mandate.

MANETTE: And what about those new drugs? Are they any better than what already exists on the market?

DR. GRAHAM: It’s a myth that is promulgated not only by industry but also by the FDA itself. It’s a misperception that our lawmakers in Congress have as well and they’ve been fed this line by industry. Industry is saying there are all these lifesaving drugs that the FDA is slow to approve and people are dying in the streets because of it. The fact is that probably about two-thirds to three-quarters of the drugs that the FDA reviews are already on the market and are being reviewed for another indication. So, for example, if I’ve got a drug that can treat bronchitis and now it’s going to be used to treat a urinary tract infection well, that’s a new indication. But it’s the same drug and we already know about the safety of the drug. There is nothing lifesaving there. There is nothing new. There is nothing innovative. A very small proportion of drugs represent a new drug that hasn’t been marketed before. Most of those drugs are no better than the ones that exist. If you want to talk about breakthrough drugs – the ones that really make a difference in patients’ lives...
and represent a revolution in pharmacology – we’re talking about maybe one or two drugs a year. Most of them aren’t breakthroughs and most of them aren’t lifesaving, but they get treated as if they were.

MANETTE: Are you at liberty to discuss some of the problems your colleagues are finding with other drugs and if so, how widespread is the problem?

DR. GRAHAM: I’m really not at liberty to talk about things that pertain to my official duties at the FDA. I can talk in my private capacity, but I can’t talk about material that would be confidential. What I can say is that there are a number of other scientists within the FDA who have also worked with drugs that they know are not safe, even though the FDA has approved or allowed them to remain on the market. They face some of the same difficulties that I do. The difference is that either the problem isn’t as serious in terms of the numbers of people that were injured or that it’s a fatal reaction – they’re not willing to expose themselves to retaliation by the FDA - and retaliation would surely follow.

MANETTE: Do you think we should have any confidence in the FDA and if so, can you elaborate on what they do that you feel benefits the American people?

DR. GRAHAM: In terms of confidence in what the FDA does, there are two things that the FDA determines when it looks at a drug: it determines whether or not a drug is safe and it determines whether or not it’s effective. Regarding the determination of drug effectiveness, I think the FDA does a pretty good job. If the FDA says that the drug will have a particular effect, probably for many of the patients who take the drug it will actually have that effect. If the FDA says a given drug will lower blood pressure and you’re somebody who has high blood pressure, there’s a good chance that the drug will have an effect that lowers your blood pressure. That has to do with the rigor with which they force the drug companies to establish that the drug actually has an effect.

On the safety side, I think that the American public can’t be very confident. They can have some confidence because it turns out that most drugs are remarkably safe. But, when there are unsafe drugs, the FDA is very likely to err on the side of industry. Rarely will they keep a drug from being marketed or pull a drug off the market. A lot of this has to do with the standards that the FDA uses for safety. When they look at efficacy, they assume that the drug doesn’t work and the company has to prove that the drug does work. When they look at safety it’s entirely the opposite. The FDA assumes the drug is safe and now it’s up to the company to prove that the drug isn’t safe. Well, that’s a no-brainer. What company on earth is going to try to prove that the drug isn’t safe? There’s no incentive for the companies to do things right. The clinical trials that are done are too small, and as a result it’s very unusual to find a serious safety problem in these clinical trials. Safety flaws are discovered after the drug gets on the market.

MANETTE: I read somewhere that a drug only has to be better than a sugar pill.

DR. GRAHAM: Right. The standard that the FDA uses to approve a drug is primarily “does the drug work?” That’s what they call efficacy. Most often, they’ll compare the drug against something called a placebo or a sugar pill. It’s basically something that doesn’t have a medical effect. The assumption is that the drug will be no different than the sugar pill. The FDA puts the onus on the drug company to conduct a clinical trial to show that the drug is different from a sugar pill. The way the FDA’s approval standards are, the drug does not necessarily have to have a very great effect in order to be approved. The drug might lower your blood pressure by just a few millimeters of mercury, but the FDA will say we can approve it because it does lower your blood pressure.

Now, would that be a benefit or are there other drugs out there – many other drugs – that patients could take instead that would lower their blood pressure by 10 or 15 or 20 millimeters? The FDA doesn’t really care about that. What happens is the drug gets marketed. You’ve got two drugs that are out there – one drug that effectively lowers your blood pressure a substantial degree and another drug that barely lowers your blood pressure at all. The company that has that second drug markets it like it’s this breakthrough medicine. It lowers your blood pressure and they have all these glitzy ads, direct-to-consumer advertising. Lots of patients and lots of doctors will use that medication. What happens in the process is these patients are actually in a sense being denied a more effective treatment because the FDA doesn’t require that drugs that come on to market be at least equivalent to, or better than, the drugs that are already there. All they have to do is be better than a sugar pill.

MANETTE: When you consider the financial impact your whistle blowing has had on the pharmaceutical industry do you have any fears that your life may be in jeopardy?
DR. GRAHAM: I have tried not to think about that. In the work that I’ve done I’ve never really thought about what the financial impact would be on any particular company. I put that out of my mind because my primary concern is whether or not the drug is safe. If it’s not safe, how unsafe is it and how many people are being hurt by it? In terms of when I identify an unsafe drug, to me it doesn’t really matter what drug company it is. I’ve helped to get ten different drugs off the market, and they’re from ten different drug companies. It’s not a vendetta against any particular drug company. I have to hope that the drug companies don’t take it personally. I’m just a scientist doing my job and I have to leave the rest to God to protect me.

MANETTE: Has anyone tried to silence you and stop you from becoming a whistleblower?

DR. GRAHAM: Prior to my Senate testimony in mid-November of 2004, there was an orchestrated campaign by senior level FDA managers to intimidate me so that I would not testify before Congress. This intimidation took several forms. One attack came from our acting Center Director who contacted the editor of the Lancet, the prestigious medical journal in the United Kingdom, and intimated to the editor that I had committed scientific misconduct and that they shouldn’t publish a paper that I had written showing that Vioxx® increases the risks of heart attack. This high-level FDA official never talked to me about this allegation. He just went directly to the Lancet.

The second attack was from other high level FDA officials who contacted Senator Grassley’s office and attempted to prevent Senator Grassley and his staff from supporting me and calling me as a witness. They knew that if they could disarm Senator Grassley that would neutralize me.

The third attack came from senior FDA officials who contacted Tom Devine, my attorney at the Government Accountability Project, and attempted to convince him that he should not represent me because I was guilty of scientific misconduct; I was a bully; a demigod; and a terrible person that couldn’t be trusted. These people were posing as whistleblowers themselves rating on another whistleblower. Some of these senior level FDA officials were in my supervisory chain and are people I work for. They were involved in a coordinated attempt to discredit me and to smear my name and to prevent me from giving testimony.

There’s one other thing that happened the week before I testified. The Acting Commissioner of the FDA invited me to his office and offered me a job in the Commissioner’s Office to oversee the revitalization of drug safety for the FDA if I would just leave the Office of Drug Safety and come to the Commissioner’s Office. Obviously he had been tipped off by people in the Senate Finance Committee who are sympathetic to the FDA’s status quo that I was going to be called as a witness. To preempt that, he offers me this job, which basically would have been exile to a fancy title with no real ability to have an impact. This was a conspiracy and it was coordinated and there was collaboration among senior level FDA officials. What a mess!

MANETTE: All of these attacks backfired on them. Tell us a little bit about that.

DR. GRAHAM: Well, Senator Grassley and his staff quickly realized that what they were saying about me was fabricated. The editor of The Lancet also realized that what the high level FDA officials were saying to him was a pack of lies. He sent emails to them saying it looked to him as if they were trying to interfere with his editorial process. He was very savvy to what these people were doing. Tom Devine, as he said publicly, was very interested in doing the right thing. He said, “We don’t want to protect somebody who’s a lawbreaker and who really isn’t representing the truth so produce your evidence.” They had no evidence because there is no evidence. But I produced my evidence. I showed him all the documentation, all the emails, and the reports that I’ve written. They flunked every test and I passed every test.

In all of the criticism I have received relating to Vioxx® and drug safety, they’ve never attacked the work or the science that I’ve done or the results that I’ve come to. What they’ve done is call me names. The ad hominem attack is the last refuge of the indefensible. They don’t have an argument that’s substantial. They know that they’re vulnerable. They know that they’ve disserved the American people. The FDA is responsible for 140,000 heart attacks and 60,000 dead Americans. That’s as many people as were killed in the Vietnam War. Yet the FDA points the finger at me and says, “Well, this guy’s a rat, you can’t trust him,” but nobody is calling them to account. Congress isn’t calling them to account. For the American people, it’s dropped off the radar screen. They should be screaming because this can happen again.

MANETTE: On CNN with Lou Dobbs you said that there was a certain “culture” that exists at the FDA. Can you explain what you meant by that?

DR. GRAHAM: The FDA has a very peculiar culture. It runs like the army so it’s very hierarchical. You have to go through the chain of command and if somebody up above you says that they want things done in
a particular way well, they want it done in a particular way. The culture also views industry as the client.

They're serving industry rather than the public. In fact, when a former office director for the Office of Drug Safety criticized me and tried to get me to change a report I'd written on another drug – Arava – he said to me and to a colleague who was a coauthor on this report that “industry is our client.” I begged to differ with him. I said, “No, industry is not the client, it's the American people, the people who pay our taxes. That's who we’re here to serve.” He said, “No! Industry is our client.” I ended the conversation by saying, “Well, industry may be your client, but it will never be my client.”

Another aspect to the culture at the FDA is that it overvalues the benefits of drugs and undervalues the risks of drugs. And so the FDA will always say to you, “Well, we’re leaving this drug on the market because the benefits exceed the risks.” Well, the FDA has never assessed the benefit of any drug that it’s ever approved. It works on what's called efficacy. Does the drug work or not? Does it lower your blood pressure or does it lower your blood sugar? Not: Does it prolong your life? Does it prevent you from having a heart attack? Those are benefits. All they focus on is efficacy.

For example, ask the FDA why on earth they didn’t ban high dose Vioxx® after the VIGOR Study showed in early 2000 that it increased the risk of heart attack by 500 percent? High dose Vioxx® was approved for the short-term treatment of acute pain. What earthly benefit was there that exceeds a 500 percent increase in heart attack risk? Ask the FDA to produce its benefit analysis that shows that the benefits exceed the risks. It doesn’t exist. The FDA has never looked at benefit. The FDA just says to the American people, “The benefits exceed the risks. Trust me. Believe me.” If you held the FDA to its proof the American people would see how badly served they've been by the FDA and its culture that belittles safety in the drug companies’ interest.

If the FDA were to pull a drug due to safety issues, it would hurt the marketing of the drug. It might also call into question why they approved the drug in the first place. Therefore, you get this culture of cover-up, this culture of suppression, this culture of denial, and this culture that demonstrates above all else that industry is the client and not the American people.

MANETTE: Have your peers turned against you?

DR. GRAHAM: No. I’ve been very fortunate. Tom Devine at GAP has told me that the experience of a typical whistleblower is that they'll have the support of their peers but the peers will be so afraid of retaliation that they won’t express that support in public.

I’ve had a very different experience. I’ve been basically embraced by my peers as someone who has said what they want to say and what they wished they had been able to say and that they recognize as the truth. They’re really proud of the fact that I’ve said it and they’re not afraid to be seen with me. They’re not afraid to work with me. I’ve been pretty fortunate in that way.

Now with management it’s been another story. Upper management avoids me and doesn’t talk to me. I could be walking down the hall and I’ll say hello, and they’ll act like I’m not there. They don’t give me interesting work assignments. They don’t call me in to consult on things that I should be consulted on even though I am the senior epidemiologist in the Office of Drug Safety with more experience than any of the other people there. I’m looked up to by the scientific staff because of that expertise. Basically, I feel like I’m in the Gulag.

MANETTE: How do you cope with that going to work each day?

DR. GRAHAM: It’s difficult. It’s a mind game. They’re hoping that I’ll just become very frustrated and disillusioned and leave or that I’ll slip up in some way so that they can take some sort of action against me. As Tom Devine at GAP has said, I have to be Saint David. I can’t afford to make any mistakes. That’s very difficult and it is a little bit discouraging. But I’ve been a target of retaliation in the past. You take ten drugs off the market well, no good deed goes unpunished at the FDA. I’ve experienced retaliation with many of those other episodes but not as severe as what I’ve experienced with Vioxx®. This is the first time that my job was actually in jeopardy and where the FDA actually intended to fire me. That was stopped only because Senator Grassley intervened. He put the heat on the FDA and told them, “Lay off. This guy has told the truth. He’s helped America. Whose side are you on?”

MANETTE: Were there any warnings that Vioxx® was a problem? Did you see the disaster coming?

DR. GRAHAM: I think that I was afraid that there would be a disaster, but I only became aware of this with the publication of the VIGOR Study, which was this large clinical trial that was done that showed that Vioxx® increased the risk of heart attack five-fold. That study was published in November of 2000. It was written, performed, and paid for by industry. What industry concluded was not that Vioxx® increases the risks of heart attack, but that the drug they were comparing it against—Naproxen®—decreased the risk of
heart attack. I knew that was not a sustainable argument. There was no way that Naproxen® was that protective against heart attacks. Clearly Vioxx® was the problem. I knew that Vioxx® was on the road to becoming a blockbuster drug (20 million users). All the ingredients were there for a disaster.

The FDA is responsible in so far as it could have prevented much of the damage, heart attacks, and deaths simply by banning the high dose Vioxx® back in mid 2000 when they knew the results of the VIGOR Study. But the FDA did nothing for almost two years. They were “negotiating” with the company over a label. What did the label accomplish? Nothing! Before the label change 17 or 18 percent of people who took Vioxx® took the high dose. After the label change 17 or 18 percent were still taking the high dose. High dose use didn’t change at all. People didn’t read the label, and if they read the label they wouldn’t know what to do anyway because it was very confusing. The right thing to do would have been to pull the high dose off the market because there is no benefit for short-term relief of acute pain that exceeds this risk. The FDA made bad decisions based on its culture and its institutionalized biases that favor industry, and as a result thousands of Americans died. Americans and Congress should be screaming bloody murder. They should be beating on the doors of the FDA demanding change.

**MANETTE:** It’s estimated that over 200,000 people a year die from prescription drugs. Do you see this as a serious problem and do you think many of these treatments are more dangerous than the disease itself?

**DR. GRAHAM:** Death from adverse drug reactions is one of the leading causes of death in the United States. It turns out that most of these adverse reactions are actually what are expected in the sense that they are an extension of the drug’s action. For example, we know that drugs for diabetes can lower your blood sugar. If you’re more sensitive to the drug than the normal person and it lowers your blood sugar too much, causing you to have a seizure while driving your car and you get killed, well, you died from an adverse drug reaction, but it wasn’t something unexpected.

The blood thinner Coumadin® is another example. That drug provides a benefit, but it is also responsible for probably more deaths than any single drug currently marketed. But it has a recognized benefit and there aren’t other drugs to do what it does or to do what it does well. So physicians accept that there are patients who are in a serious situation and who might die without the drug, so they take it.

Yes, drugs cause a lot of harm. Unfortunately, we haven’t quantified the benefits. For most of these drugs it’s more belief. It’s faith. We have faith that they’ll confer a benefit, but the FDA hasn’t demonstrated that they confer a benefit. We’re getting much better at quantitating the risks. In the future what we need to do is just take the risks and look hard and dispassionately at what the real benefits are. If the benefits aren’t there we shouldn’t be having discussions about labeling the drug. You need to weed the garden patch of drugs that aren’t doing what they’re supposed to do. The FDA has not been very good about that; it likes to cultivate all these weeds.

**MANETTE:** In a perfect world what role do you see the FDA playing in our nation’s health?

**DR. GRAHAM:** In a perfect world, I think the FDA would need to be restructured. If it were restructured properly, I think that it could actually provide a great benefit to the public health. I would recommend several changes. First, I would separate safety and post-marketing from the pre-marketing. I would create a separate center for product safety. Actually, Senator Grassley and Dodd have recently introduced legislation to create an independent center for post-marketing safety that would serve to protect the American people from unsafe drugs. This isn’t happening now.

On the pre-marketing side, the FDA needs to pay greater attention to safety. They need to have larger clinical trials. They need to compare drug products against other drugs that treat the same indication rather than comparing a drug against a sugar pill. What we want in the end are drugs that actually have better benefit.

The FDA also needs to determine the post-marketing benefits of a drug. I’ve done that for several drugs. How many people are actually benefiting? How many people are living longer versus those who are having their lives shortened? Only when you have that kind of information can you make rational decisions about a medication. The times when I’ve done the benefit analysis, I’ve been chastised, criticized and suppressed by the FDA. These benefit analyses should be done as a matter of routine.

There is a lot that the FDA could do to improve, but the changes aren’t going to happen on their own. Congress is going to have to make them happen. There’s an expression, “the zebra doesn’t change its stripes nor the leopard its spots.” The FDA isn’t going to change the way it does business; changes will have to be imposed from outside.
MANETTE: How do you feel about direct-to-consumer advertising?

DR. GRAHAM: Direct-to-consumer advertising in general is a great disservice to the American people. We see wonderful ads of people demonstrating their health, whether they’re skating across the ice or doing their Tai chi. Madison Avenue knows that a picture is worth a thousand words, so they convey an image, a message, and it makes an impression on patients and on physicians. It creates needs or desires where there really isn’t a need or a desire.

There was a recent study in The Journal of The American Medical Association that showed that if patients mentioned a drug that they’ve seen on television to their physician they were much more likely to be prescribed that drug by the doctor. Drug companies know this. That’s why they do it. Would the Vioxx® disaster have been as great and as large in the absence of direct-to-consumer advertising? I submit that the numbers would have been far lower than what they were. Direct-to-consumer advertising is part of what made Vioxx® a blockbuster drug. It helped to rev the market up to get people to want to use the drug.

Clearly, direct-to-consumer advertising does not serve the American people well. Madison Avenue is smarter than the most intelligent American. That’s why they make so much money and that’s why the drug companies go to them to sell their products. We’re not living in a neutral world where the information we’re getting is objective and unbiased. It might be that the average American, given all the data, all the facts, and all the information in an objective way could make an intelligent, rational decision. But we don’t live in that kind of world. We live in a world where what we’re seeing is a visual image of these people being vital and healthy and cured of their illnesses. And it’s all because of this little pill that they’re taking. A patient with that condition says, “I want to be just like that person.” So they go to the doctor and say, “I want that pill.” Are their lives changed? Maybe some people’s lives are changed, but I think most aren’t.

MANETTE: What do you think people hear when they’re watching the ad and after the ad they list all the possible side effects?

DR. GRAHAM: I don’t think it registers. You hear anything. I don’t think that people come away with it and they certainly don’t come away with any sense of how likely it is to happen because the visual image overpowers anything that gets said.

It’s the same with the ads that appear in magazines. Companies are required to put some of the labeling in the ad. You have the ad on the one side – that’s the picture. It shows this person being healthy because they take this pill. The fine print is all on the next page. People aren’t going to read the fine print. It’s the same thing with labeling for physicians. Physicians don’t read product labels. Where do they learn about drugs? They learn about drugs from the detail person from the drug company or from other colleagues who have used the drug. They’re not learning it from the labeling.

MANETTE: Do you think there is a criminal cover-up going on between the FDA and Big Pharma to approve dangerous drugs that sicken and kill Americans?

DR. GRAHAM: I have no knowledge of criminal activity and I’m sure there are legal standards for what’s criminal and what’s not. I do think that there is an institutional bias at the FDA that says we will look for a way to say “yes” to the approval of any drug that comes down the pipe. If a drug is so bad that they can’t find a reason to approve it, they won’t. But, if there is any way that they can approve the drug, they will. The way this is done is by what’s called the “indication.” Why is it that you’re going to take the drug? Maybe you’re going to take it because you have high blood pressure. Maybe you’ll take it because you have high cholesterol. That’s the indication. A company may come in with a drug and want to get it approved for five different indications. One of them is a really insignificant indication that affects a very small number of people. The main indication might affect millions of people. The drug doesn’t show efficacy for that major indication, but they’re able to somehow or another approve the small indication.

So the drug gets approved for this narrow indication, but the FDA and the drug company both know that it’s going to be used for that other indication. It’s going to be used “off-label.” Then, the FDA turns around and says that they don’t regulate the “off-label” use of drugs. No. But, they aid and abet it. They allow it to happen and in many instances “off-label” use of a drug product is a public health threat. The FDA has a responsibility to protect the public health. The FDA should be intervening, but they don’t. In my own experience I have seen multiple examples where I’ve heard people say, “We can’t ask a company to put that in the labeling because the company will say no.” Or, “We
can’t do that because that will decrease their marketing. We’ve got to try to approve this drug. Let’s see if we can give them this small indication. At least it’s giving them something. You’ve got to find a way to say yes.”

That is the typical attitude of the FDA culture. I think Congress is partially responsible for that because when they issued the PDUFA, the Prescription Drug User Fee Act, what they were really saying was, “We want you to review these drug applications more quickly because you’re keeping lifesaving medicines from the American people.” That’s the line they were fed by Big Pharma. So they pressure the FDA and the FDA gets the message. It’s a really pernicious system. I think it’s unfortunate. There are many people from the FDA who have examples that they unfortunately can’t talk about. They’d lose their job and maybe get thrown in prison because you can’t discuss confidential and trade secret information. But the fact is these things happen at the FDA and there have been multiple examples in the past where one could see evidence of that.

**MANETTE:** Did your faith as a devout Roman Catholic play any role in the decisions you made to put your career on the line to report the truth?

**DR. GRAHAM:** It did in so far as my faith forms my conscience. It’s sort of my sense of what’s right and what’s wrong and what I am and am not responsible for. I was in a situation here with Vioxx® where I was invited by Senator Grassley’s office to testify. I could have told them no, but then they would have subpeo-naed me. So of course I went peaceably. I was faced with this dilemma. Should I lay it on the line and tell them the way it really is or do I kind of downplay it? There are ways of doing that.

What I concluded was that I’m now being given the opportunity to tell the truth to the people who are in a position to actually make a difference. I can’t make a difference. I can’t change the FDA, but Congress can. If I don’t tell them the truth, then I’m now responsible, in part, for future deaths. I don’t want to become a co-conspirator with the FDA in what happens with Vioxx® because tens of thousands of people were injured or killed because of the FDA’s disregard for safety. If I keep quiet about that, now I’m part of the problem. I’m one of them, and at that point then my conscience asks me, “You know what the truth is, are you going to speak it or aren’t you?”

So I went ahead and did that and prayed that it all works out well for me personally. That I have a job and I’ll be able to support my family, that I’m protected from retaliation, that maybe some good will come out of that. My faith plays a role, but it wasn’t a direct teaching of the church. You have to do x, y and z, but it’s the faith as I’ve internalized it. My conscience is formed by the voice of Christ speaking internally to me. That’s what the conscience is; it’s the voice of God speaking to each and every one of us about what’s right and what’s wrong. I knew what was right. If I walked away from that nobody else would have to do anything. I’d be beating myself up because my conscience would condemn me. So yes, faith plays a part in everything that I do. It’s not saying I’m a saint, because I’m not. But I can’t separate who I am from my religious faith. It’s all part of the same person.

**MANETTE:** Do you think Congress genuinely wants to fix the problems at the FDA or are too many politicians influenced by the pharmaceutical industry?

**DR. GRAHAM:** I don’t know what Congress will do in the end. My hope is that they will act decisively to reform the FDA and make the American people safer by having strong post-marketing. Will that happen or not? I don’t know. I think there are many people in Congress who see this as a serious problem and who very much want to see a change. I think at the same time there are other people who don’t think it’s such a bad problem, and many of those people honestly believe that. For those people I’d say they haven’t seen the evidence so they don’t really understand how bad the problem is. There are undoubtedly some people who are influenced by industry. Does that influence their judgment in the end? I don’t know. They’d probably say no, it doesn’t. Maybe at a conscious level it doesn’t. But we have the same phenomenon in the scientific world where we look at research studies that are funded by industry and studies that are funded by government, by National Institutes of Health or the Medical Research Council in the United Kingdom. Multiple studies have been done that have shown that if your study is funded by industry you are much more likely to come up with the result that’s favorable to the drug company than if your study on the same subject is funded by an independent body unrelated to the company.

Now, are the researchers who did this study biased? Are they consciously cheating and manipulating the data and everything else? No. I don’t think that’s happening at all, but the fact is if the study is funded by industry it’s much more likely to be favorable to industry. Without attributing bad motivations to the scientists doing those studies all I can do is point to a strong correlation.

With Congress I would be concerned that there could be a strong correlation there because Pharma
is very bright. They fund as many politicians as they can. They get to the Republicans and the Democrats. Look at the funding on the major committees, the Health, Education, Labor and Pension Committee in the Senate or the Oversight and Investigations Subcommittee in the House. The Wall Street Journal reported recently that many people on these committees are funded by industry to a substantial degree. Industry knows how to exercise influence. What we have to do is overcome that influence with evidence, and then rely on the fact that at the end of the day the Congress will do what's best for the American people.

Will that happen? I don't know because then it gets embroiled in politics. You know, Republicans versus Democrats, the left versus the right, conservatives versus liberals. Yet, what we're talking about is public health and public health is nonpartisan. I can say this with certainty. For every member of the House of Representatives somebody in their district died because of Vioxx®. Somebody in their district had a heart attack because of Vioxx®. For every Senator in the Senate, many more people in their state died because of Vioxx® or had a heart attack because of Vioxx®. It doesn't matter whether it's a red state or a blue state. Those are human beings and what we're talking about is public health. What I'm hoping is that Congress will respond. There is a problem and the evidence is overwhelming, but we'll just have to wait and see.

**MANETTE:** What are your thoughts on former President Bush's attempt to pass tort reform, which would protect most pharmaceutical companies from lawsuits except in the most egregious cases?

**DR. GRAHAM:** I think it's dangerous and wrong for the following reasons. We already have an FDA that's been neutralized by industry and sees industry as its client. The Center for Drug Evaluation and The Office of New Drugs dominates drug safety so that the drug safety is not independent. Drug safety can't protect the American people. So government now isn't going to protect the average citizen from the consequences of unsafe drugs. The only alternative they have left is the legal system – the tort system. It's not a wonderful system. It would be much better if we had effective post-marketing regulation so that we could get bad drugs off the market before they hurt more people, but that's been neutralized. All that's left to people now is the courts. That's the only way we have of getting companies to change their behavior.

What tort reform will do is remove that threat as well. It's basically giving companies immunity because now the people who are injured by the drugs can't recover damages that might actually mean something to industry. I mean $250,000 for damages; they blow that in one ad campaign. To them that's nothing. But a lawsuit for multiple millions of dollars has more of an impact. Now, is that optimal? No. But the fact is that since we have a regulatory agency that doesn't regulate and we have a public health agency that doesn't protect the public, we have thousands of people who are being injured by products that the FDA knows are unsafe. The FDA knew there was a problem with Vioxx®. They knew it was a big problem back in mid 2000 yet did nothing about it.

There has to be a system in place that reins companies in. If the FDA isn't going to exercise control over companies, then who will? How will it happen? I don't think that working through the courts and lawsuits is a particularly effective way of doing it; but it's the only recourse we have now, and that will be removed as well. You can demonize the trial lawyers but I think that there are patients who are severely injured by drugs. The defense is, "It's on the labels so we're protected." The problem is that nobody reads the labels so how do they protect anyone? The FDA should be making those decisions.

**MANETTE:** What can you tell us about all the antidepressants on the market that millions of children are taking?

**DR. GRAHAM:** In early 2004, SSRI antidepressants and suicidal behavior was a big safety issue. The FDA had suppressed a report written by a colleague of mine in drug safety and had prevented him from presenting this information in an advisory committee meeting. That information leaked to the media, embarrassing the FDA because it had been caught suppressing very important information – that most of the antidepressants don't work for treating children. Someone in my supervisory chain initiated a criminal investigation to identify the person who had leaked this information to the media. It turns out that the investigation ordered by these FDA officials was illegal. They broke federal laws – at least two or three federal laws – in ordering this investigation.

I think it's well established that depression is very common in adolescence. With the antidepressants that we have on the market right now only one of them has been shown to work in children and that's Fluoxetine or Prozac®. All the other SSRI antidepressants are no better than sugar pills. However, if you were to read the labeling for these drugs it doesn't point that fact out so patients think one SSRI is as good as another. This is another way that the FDA has betrayed the American public and has betrayed the public health.
With the SSRI and antidepressants what the FDA should have insisted on was a signed informed consent at the time a child was going to be treated. That informed consent would say three things. One, these are the antidepressants that are available. Only Fluoxetine has been shown to work for depression in children. All the other drugs are no better than placebo. That's point two. No better than placebos. No better than sugar pills. Third, all of these drugs appear to have the ability to increase the risk of suicidal behavior. As a parent, if I see that in writing and the psychiatrist or GP is going to write the prescription and put my child on some drug other than Fluoxetine, I can say, “Doc, why are you putting my child on a drug that doesn’t work in kids.”

The FDA didn’t want patients to have that information so they refused to have signed informed consent. The companies didn’t want the patients to have that information because all of a sudden the “off-label” use of these drugs would dry up. So whose interest was being served there?

MANETTE: How do you feel about taking the approval process out of the hands of the FDA?

DR. GRAHAM: Well, where would you put it? If you put it somewhere else they’re going to eventually become co-opted the way the FDA has been co-opted. I think the most that we could probably hope for is to try to disassociate the industry pressures from the approval decision. You have to change the culture of the organization, and you have to change the incentives in the organization. The culture and the incentives that the FDA operates by would have to be changed, and Congress can do that through legislation and by establishing different standards for how a drug gets approved. Not only do you have to show that the drug is effective, but you’ve got to show that it works as well or better than other drugs that treat that indication. You’ve got to prove to me that the drug is safe, not that the drug is harmful because you’re never going to prove to me that the drug is harmful. You set up stringent standards of evidence that might lead to the approval of safe drugs that actually have benefits to the population.

Then pair that up with an independent post-marketing regulation. Currently, the pre-market people who approve the drug decide what happens after it’s on the market. If the drug needs to come off the market, they’re the ones who have to say yes at the end of the day. The people at the FDA who approved the drug, the Office of New Drugs, they are the single greatest obstacle when it comes to removing unsafe drugs from the market. I can vouch for that from personal experience. What you have to do is you have to take that responsibility and power away from them and put it with the group who sees their mission as serving the public and protecting the public health from unsafe drugs. I think if you do those two things you’d be a long way towards getting the FDA on the right footing.

Also, it would probably be beneficial not to have the FDA's funding come from industry. He who pays the piper calls the tune, and we now have a captured agency. Industry underwrites more than 50 percent of the Center for Drug Evaluation’s budget. When industry yanks the chain whose neck is going to get tugged? The Center for Drug Evaluation! If industry isn’t happy with them and the funding dries up what are we going to do? We’re going to have to let half our people go. The program is going to shrink. Congress is going to be jumping up and down on our back. So it’s a captured agency and America is not well served when industry is calling all the shots. Yes, industry has a right to make a legitimate profit from marketing products that help the American people. But you shouldn’t have a situation that just basically leaves the American public defenseless. And that’s what we have right now. We’re virtually defenseless.

MANETTE: Are there other Vioxx®’s out there? Do you think this will repeat itself at this high profile level?

DR. GRAHAM: At this current moment I don’t think there are other drugs out there that are as bad as Vioxx® in terms of the enormous numbers of people that were hurt. During my Senate testimony I did mention that there were five other drugs that I thought the FDA really needed to reevaluate because in my estimation the benefit to risk was misjudged. After I named those five drugs the FDA was in the media saying that I did junk science and that these drugs were safe and effective and that I was a crackpot. However, recently the FDA announced that they were going to take Bextra® off the market. Well, Bextra® was one of the five I mentioned. They announced that with Acutane® they were going to impose a restricted distribution system. Well, I had recommended a restricted distribution system 15 years ago. The major problem with Acutane® is that it’s just so widely overused that it causes an enormous amount of potential harm to pregnancy exposure. If we restricted the use of the drug to the small number of women who really need it each year, the problem would be pretty much resolved. But the FDA didn’t want to do that because it would interfere with company profits. If you restrict the distribution and only one-tenth of the people who are getting it now are getting it tomorrow, profit will drop 90 percent. Of course companies aren’t going to go along with that and the FDA isn’t going to do anything that’s going to harm corporate profit.
After my Senate testimony the FDA announced that they can look at other drugs – not only the other three of the five that I mentioned. There are other drugs on the market that I prefer not to talk about that the FDA knows are killing people. Ten or 100 people a year are dying because of the use of a particular drug or being hospitalized. Hundreds or maybe thousands of people are being hospitalized each year. For some of those drugs the benefits do exceed the risks. For others, it’s clear that more could and should be done and maybe that means restricting the distribution of the drug’s use or maybe it means banning an indication for the drug saying the drug should not be used for particular indications. Maybe it would be something like with the SSRI’s where I believe there should be signed informed consent so that parents will know that the drug the doctor is prescribing for their son or daughter actually doesn’t work in children.

I think that there are many things that can be done that haven’t been done. There are other unsafe drugs out there, and the nature of our business is that a drug could be approved tomorrow that turns out to be the next Vioxx® and we won’t know until it happens. Then the question is, how quickly do we identify the problem and how quickly do we take effective action against it? We’re pretty good at identifying these problems quickly. Where the FDA falls flat on its face is that there is a long period of time in which it does nothing. Then what it normally does is woefully inadequate and ineffective and as a result the body count mounts and that needs to be changed. Maybe Congress will change that.

**MANETTE:** Let’s talk about incentives. When you say incentives what do you mean? For example, working at the FDA, is their pay somehow based on how many drugs they approve?

**DR. GRAHAM:** Currently, the performance evaluations for managers at the FDA are built around the drug review. How many reviews did they get done? Did they meet their PDUFA deadlines? It looks bad if you miss your PDUFA deadlines. The unspoken mores—what’s the expected—is that you’re going to approve as many of these drugs as you can. There has to be an overwhelming reason for you not to approve. Frequently what will happen is that these medical officers in their review will recommend that a drug not be approved and they get overruled by the higher ups because the higher ups are answering to a different set of incentives. You have to change that. A lot of that comes from the leaders. What I want to see is does the drug really make a difference? Is it beneficial?

**MANETTE:** Do you think that the FDA should not be partially funded by industry?

**DR. GRAHAM:** I think that PDUFA funding for the FDA is a mistake.

**MANETTE:** Can you explain that a little more clearly because most people don’t know what PDUFA funding is?

**DR. GRAHAM:** The drug companies pay a substantial amount of money to the FDA at the time that they bring a drug application for approval in order for the FDA to review the drug. Basically it’s a tax. It’s a fee. Industry pays the fee, and the FDA will review the drug application. But the real expectation is from the company: “We’ve paid our money, now approve our drug.” That’s basically how the FDA reacts as well. I think that the funding for the FDA should be independent of the industry that it’s regulating and I think in the scientific field there’s good evidence to support this notion. Industry money is influencing the decisions that get made, and it creates this incentive structure. You have this culture, you have these expectations, you have pressure from Congress. All of them come to a head at the FDA and all of those incentives are in the direction of “approve the drug.” That’s what happens so I believe that the FDA is unduly influenced by industry and that undue influence is in part the result of industry money funding the FDA operations.

**MANETTE:** Dr. Graham, thank you for your commitment to your convictions and for sharing insights that drove you to save many lives.

**DR. GRAHAM:** You’re welcome. I hope I’ve helped.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.
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ArthroMax is also available with Black Tea Theaflavins (without UC-II®) to protect against immune attack in the joints via a separate mechanism.

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Methylsulfonylmethane (MSM) 1000 mg
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Boron (calcium fructoborate as patented FruiteX B® OsteoBoron®) 1.5 mg

The retail price of a bottle of 120 vegetarian capsules of ArthroMax™ with Theaflavins and AprèsFlex™ is $44. If a member buys four bottles, the price is reduced to $30 per bottle.

References

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Energy is our most precious resource. With age, both our physical and cellular energy levels decline.¹ Not only do we feel tired, but our cells become fatigued and fail to optimally function.

Additionally, our heart muscle weakens and does not contract as fully, often leading to congestive heart failure.² **D-ribose** can help replenish the metabolic energy needed by all our cells, including those in major organs such as our heart and brain.³-⁵ The result? Increased vitality, along with improved cardiac and neurological function.

Ribose serves a number of other key processes in the body. Long chains of d-ribose are strung together to form ribonucleic acid or RNA, the DNA-like structures essential to copying our genes and translating them into functioning proteins.⁶ D-ribose provides antioxidant protection for body tissues.⁷ Even the immune system needs d-ribose to power its response to infection.⁸

In this article, you’ll learn how d-ribose supplementation can assure that vital body processes aren’t starved of essential energy molecules. > >
low-level ischemia occurs on a continuing basis in people with advancing coronary artery disease, gradually producing symptoms such as angina (chest pain) with exertion. As ischemia worsens, the pain can occur even while the patient is at rest.

Each episode of angina represents steady depletion of cellular energy levels, with loss of the energy molecule, ATP from heart muscle cells. This uses up the heart’s normal supply of d-ribose. Under these circumstances, d-ribose becomes a conditionally essential nutrient.

Continued long enough, this cellular energy starvation is a major contributor to congestive heart failure (CHF), in which heart muscle can’t “squeeze” hard enough to move blood efficiently. The result is that fluid accumulates in tissues throughout the body as a result of poor cardiac “squeeze” (technically called contractility). The end result is progressive exercise intolerance, increasing difficulty breathing, and fluid retention. In the extreme, congestive heart failure can result in the deadly accumulation of fluid in the lungs—known as pulmonary edema—that is the ultimate cause of death for many victims of heart disease.

Many people with congestive heart failure find themselves on multiple medications aimed at reducing fluid accumulation or chemically increasing the heart’s contractility. While these drugs can have some success, none are curative, and most have substantial side effects that can limit their utility.

Fortunately, congestive heart failure can be partially reversed, more readily if it is detected and treated early.

**Potent Cardioprotectant**

Increasingly, scientists are investigating the ischemia-energy relationship that links the severity of heart muscle damage to the supply of energy-mediating nutrients such as d-ribose.

A noted cardiologist and author Stephen T. Sinatra, MD, who has written extensively on the cardiac benefits of d-ribose, recently stated, “Many physicians are not trained to look at heart disease in terms of cellular biochemistry...” But the growing interest in this field over the past decade opens the door to safer and much more effective therapy with cardiac energy preparations based on d-ribose, providing metabolic support for ailing heart muscle.

The benefits of d-ribose began to interest researchers in the early 1990s. Those early studies were mainly focused on d-ribose as an aid in radiology techniques such as thallium scanning, which indicate areas of ischemia in the heart. Researchers found that by
infusing d-ribose intravenously during the scan, they could see many more areas of heart muscle—because much more blood was permeating those tissues.16,20

Too often, individuals with coronary disease have limited mobility or are unable to engage in moderate exercise due to such limitations as lack of energy. German researchers found that they could use d-ribose to increase exercise tolerance in people with severe coronary artery disease and chronic ischemia.10 They gave patients an oral dose of 60 grams daily in four divided doses for just 3 days to achieve gains in endurance.

More recently, a different German group showed that d-ribose could improve heart function, as seen on echocardiograms, while also improving quality of life in patients with congestive heart failure.21

Through the recovery of ATP energy molecules and an increase in the heart muscle’s energy levels, d-ribose improves heart muscle contractility—the “squeeze” needed to pump blood efficiently to the lungs and the body in general.22,23

When d-ribose was given intravenously to patients who have suffered one or more heart attacks, scientists found that the d-ribose increased the number of heart segments with good contractility, a visible marker of improved function.24

D-ribose’s replenishment of heart muscle energy levels has additional benefits, as was shown in a recent study of patients with advanced congestive heart failure and extreme exercise intolerance.25 Researchers gave these patients d-ribose at 15 grams a day in three doses. The patients all had impressive improvement in their ability to breathe and ventilate their lungs, and a 44% improvement in their heart failure classification! These changes were significant, because they meant that this group of severely impaired patients could move about more freely and with increased comfort.

Neuroprotection

D-ribose has unique protective effects specific to brain cells.

In a recent study, cardiologists revealed that d-ribose not only improves heart function and blood flow—but also has a profound impact on brain tissue during the period of low blood pressure that can follow a heart attack.21 D-ribose reduced expression of a protein that triggers cell death in brain cells deprived of blood flow. This can also be a life-saving defense in the case of a stroke.23

The neuroprotective effect of d-ribose has major implications, because heart attacks and strokes contribute enormously to the age-related cognitive decline that is so prevalent today.

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D-Ribose: Increasing Cellular Energy

- **Cellular energy management** is of increasing interest to physicians caring for patients with cardiovascular disease and many other age-related conditions. Reduction in cells’ ability to use available energy exposes tissues to increased risk of damage by oxidants and inflammatory reactions, and reduces organs’ efficiency.

- D-ribose is central to energy metabolism, forming the backbone of the vital ATP molecule that cells use to transfer energy. Cellular damage by oxidants, inflammation, and ischemia/reperfusion injury causes loss of ATP and increased vulnerability to disease.

- Supplementing with d-ribose restores cellular ATP to normal levels, providing powerful protective benefit in cardiovascular disease, even following a heart attack, congestive heart failure, or stroke.

- Supplemental d-ribose also holds promise for management of kidney disease, and even frustrating conditions such as fibromyalgia and restless leg syndrome.

- New discoveries about d-ribose make it one of today’s hottest topics in the context of how we understand the relationship of energy management and chronic illness.
The neuroprotective benefits of ribose may spring partly from the antioxidant effects it provides throughout the body.26 But it is ribose’s remarkable ability to restore energy-depleted tissues back to near-normal that is generating enthusiasm among scientists.

Supplementation with d-ribose increases the available amounts of ATP in brain tissue, just as it does in heart muscle.27 This is important, because the brain uses an enormous proportion of our total energy resources.

**Fibromyalgia**

Fibromyalgia (FM) and chronic fatigue syndrome are conditions that often occur together and are believed to have a similar underlying cause.28

There’s accumulating evidence that defective production of ATP is the culprit.28-30 These findings make d-ribose a natural candidate as a therapy for those suffering from fibromyalgia and chronic fatigue syndrome. A published case study showed that a woman with fibromyalgia experienced a decrease in symptoms following supplementation with d-ribose.31 The patient had been unresponsive to prior medications, and her physicians based their decision on the known energy-enhancing capabilities of d-ribose.

A larger study soon followed enlisting 41 patients with fibromyalgia or chronic fatigue syndrome.28 Subjects took 5 grams of d-ribose three times daily until they reached a total of 280 grams.

There was significant improvement in all five categories on a standard score: energy, sleep, mental clarity, pain intensity, and well-being.28 On average, patients reported a 45% increase in energy levels.

While fibromyalgia and chronic fatigue syndrome remain complicated and perplexing to scientists, these findings offer real hope for a solution.

**Restless Leg Syndrome**

Restless leg syndrome (RLS) is a common disorder that affects as many as 15% of the US population, and it is severe enough to warrant medical treatment in more than a third of those people.32,33

The condition involves an uncontrollable urge to move the legs, accompanied by uncomfortable sensations, and it is usually worse at night.33 Only a few medications offer even partial relief of restless leg syndrome, and many make the condition worse—leaving sufferers without much recourse.32,33

Disordered energy metabolism has been suggested as one possible cause of restless leg syndrome.

### Ungrounded Fear: Can D-Ribose Cause Glycation Reactions?

It is now generally accepted that d-ribose supplementation provides many health benefits, particularly in the area of cellular energy management.

Several recent publications, however, have raised the question of whether d-ribose—because it is a sugar—could possibly contribute to development of harmful advanced glycation endproducts.40-43

The truth seems to be straightforward: Like any sugar, ribose can indeed cause protein glycation, with resulting damage to tissues.42 And when ribose is administered experimentally at the same high dose as glucose, ribose quickly causes the protein cross-linking that is the outcome of glycation.40

But those studies used artificially high doses and concentrations of ribose, levels never found in humans—even after high-dose supplementation.

For example, in a human study of d-ribose supplementation at doses of 20 and 53 grams over a 4-hour period, peak serum ribose levels rose to only 4.8 mg/dL and 81.7 mg/dL, respectively.44

But doses used in the glycation experiments were significantly higher, up to 30 times higher than achievable in human blood.42,43

And in an experiment showing that d-ribose induced glycation and impaired spatial cognition in mice, the ribose concentrations used were equivalent to blood levels of 150 to 750 mg/dL, clearly vastly higher than have been used in human studies.48,44

Researchers seeking to show that ribose-induced glycation could enhance cartilage damage in an animal model of osteoarthritis showed conclusively that even direct injection of ribose into the joint was incapable of triggering sufficient glycation to cause injury.45,46

The doses for d-ribose studies reported in this article—15 to 60 grams per day in divided doses—are incapable of causing serum ribose concentrations high enough to get anywhere near the risk of excessive glycation reported in the lab studies.44

Also, most human studies recommended splitting the total amount into three daily doses; this approach provides even greater assurance that serum d-ribose remains well within safe levels.
Low levels of adenosine, the d-ribose-containing central molecule in ATP, have been reported in those suffering from restless leg syndrome.34

Based on that observation, one study has been carried out in which daytime symptoms were eliminated, and nighttime symptoms significantly reduced, on daily doses of 15 grams of d-ribose, taken as one 5-gram dose with breakfast, lunch, and dinner.26

It's clearly too early to claim that d-ribose cures the condition, but these encouraging findings—coupled with complete absence of side effects—warrant further investigation.

**Kidney Protection**

Like the brain and heart, the human kidney receives a high proportion of the body's total blood flow—which makes it equally vulnerable to damage by ischemia-reperfusion mechanisms, the loss and restoration of blood flow.

These kidney injuries can occur as the result of trauma or during any major surgery, sometimes worsened by chronic conditions such as cardiovascular disease and diabetes.35-37

Growing evidence suggests that an immune activation and inflammatory response following this kind of kidney injury creates the bulk of the damage, especially in those with diabetes.12,38 Adenosine, which is partly made from d-ribose, is an important regulator of kidney function, and is especially vital during times of injury.39 These observations—coupled with what we know about d-ribose as antioxidant and anti-inflammatory—have aroused considerable interest among kidney researchers.

Japanese scientists have led the way in investigating d-ribose as a kidney protector: They have found that in rats subjected to renal ischemia-reperfusion—similar to what can occur during major surgery—d-ribose significantly reduced the release of inflammatory cytokines.12 Kidney function and appearance following the injury was improved substantially.

They also showed that d-ribose reduces activation of neutrophils, the ubiquitous white blood cells that are the first to arrive at the scene of an injury but that also release toxic chemicals and oxygen radicals that can cause additional harm.11

Clearly researchers are only beginning to realize the substantial potential of d-ribose for kidney health.

**Summary**

D-ribose is an essential component in our bodies' cellular energy management systems. Additionally, it provides antioxidant, anti-inflammatory, and gene regulatory capabilities. Together these characteristics make it of compelling interest to forward-thinking clinicians and patients.

Supplemental d-ribose demonstrates cardioprotection—even late in the disease process when heart attacks have already occurred, and when heart failure is developing. D-ribose helps ailing heart muscle maximize its effort, and improves blood flow to oxygen-starved cardiac tissue.

D-ribose supplements are only just being explored for similar benefits in brain and kidney tissues, but recent studies offer great hope in those areas. Even perplexing conditions such as fibromyalgia and restless leg syndrome seem to be yielding to the energy-related benefits of d-ribose.

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

**References**


KRILL HEALTHY JOINT FORMULA
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Maintaining healthy, flexible joints is essential to quality of life. Joint stiffness and discomfort can stand in the way of performing even simple everyday tasks.

Most people do not obtain critical nutrients shown to support youthful joint function and mobility.

To meet this urgent need, Life Extension® introduced Krill Healthy Joint Formula, a patent-extension blend of deep-sea whole krill oil sourced in Antarctica, combined with hyaluronic acid and astaxanthin.

In a recent clinical trial involving over 100 maturing individuals, a 55% reduction in joint discomfort was observed in less than three months, with 63% of participants maintaining ease of motion.1

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The data reveals that the fatty acids found in krill oil are particularly effective for joint health.2 These unique fatty acids have been shown to specifically target joint tissue.3,4

Hyaluronic acid occurs naturally in the joints,4 where it acts to lubricate and cushion against repeated physical impacts.5 Because it forms a major component of cartilage and soft tissue,4 it is widely used to promote joint health.6−8

The difficulty has been that hyaluronic acid is a large molecule not well absorbed by the body. When combined with krill oil, it has been shown to reach significantly higher levels in the bloodstream than in standalone form.9

Krill oil is a natural source of the antioxidant carotenoid astaxanthin. Astaxanthin works in multiple ways, including suppression of free radical activity and enhanced mitochondrial function.9 It also maintains krill oil’s molecular stability.

Most commercially available krill oils do not contain significant amounts of astaxanthin because it is nearly eliminated during processing. Krill Healthy Joint Formula is fortified with astaxanthin, for maximum stability and superior benefit.

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The suggested daily serving of one Krill Healthy Joint Formula softgel daily supplies 353 mg of this proprietary blend.

A bottle containing 30 softgels of Krill Healthy Joint Formula retails for $32. If a member buys four bottles, the price is reduced to $21.75 per bottle. Just one softgel a day of Krill Healthy Joint Formula duplicates a successful human clinical trial.

References

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

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To order Krill Healthy Joint Formula call 1-800-544-4440 or visit www.LifeExtension.com

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Many people striving for peak performance—or just concerned about heart health in general—are unaware that depletion of cellular energy in heart and muscle tissue can affect normal daily function.

The primary energy source for all cellular processes is a molecule known as ATP (adenosine triphosphate). Healthy, active cells constantly replenish their supply of ATP to produce vital cellular energy. However, under conditions of strenuous exercise, stress, injury, or aging, critical body tissues such as heart and skeletal muscles may not replenish ATP as quickly.

D-ribose, a carbohydrate molecule found in every living organism, facilitates the production of ATP. In studies of healthy athletes, as well as those who have suffered injury to the heart muscle, supplying fatigued muscle cells with D-ribose quickly restored ATP levels to normal.1-4

D-Ribose Tablets and D-Ribose Powder can help speed energy recovery, increase energy reserves, and maintain youthful energy levels in heart and muscle tissue.

- For healthy adults seeking to optimize their physical performance or simply restore everyday energy and strength, the recommended daily dose of five tablets of D-Ribose Tablets taken with food supplies 5,100 mg of patented Bioenergy RIBOSE®, a premium patented brand of ribose studied in many clinical trials and recommended by leading cardiologists.

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“I take Bioenergy Ribose® because it helps my endurance during workouts and muscle recovery when I’m done. Bioenergy Ribose® helps me consistently perform my best with the world’s fastest rowers.”

Susan Francia, Rower
2012 & 2008 U.S. Olympian, Olympic Gold Medalist
5-Time World Champion
“I couldn’t be more excited to partner with Bioenergy Life Science. Not only do I get the value of Bioenergy Ribose® to improve my endurance and recovery, I get to work with a company that is as conscious about the purity of their product as I am about what I consume. It is extremely refreshing.”

Laura Bennett
World Class Triathlete
2012 & 2008 U.S. Olympian

A bottle containing 100 tablets of 1,020 mg D-Ribose Tablets retails for $32. If a member buys four bottles, the price is reduced to just $21 per bottle. A jar containing 30 servings of 5,000 mg D-Ribose Powder retails for $27.50. If a member buys four jars, the price is reduced to just $18.56 per jar.

To order D-Ribose Tablets or Powder, call 1-800-544-4440 or visit www.LifeExtension.com

References

Caution: D-ribose can actually lower blood sugar levels. Therefore, people with insulin-dependent diabetes should check with their health care practitioner before taking it. D-ribose should be taken with meals, or mixed into juice, milk, or fruit, to offset the blood glucose-lowering effect.
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William Davis, MD
Dr. Davis is a cardiologist and author of the New York Times Bestseller, Wheat Belly: Lose the Wheat, Lose the Weight and Find Your Path Back to Health, the book that introduced the dangers of modern high-yield wheat, altered by genetics research in the 1970s, to the public.

Abraham Morgentaler, MD, FACS
Dr. Morgentaler, the Director of Men’s Health Boston, is an Associate Clinical Professor of Urology at Harvard Medical School, Beth Israel Deaconess Medical Center. Dr. Morgentaler and his clinical work with testosterone were featured in The New Yorker, and his comments have been published in journals such as Newsweek and US News and World Report.

Daniel Amen, MD
Dr. Amen is a psychiatrist, brain imaging and brain enhancement expert and four time New York Times bestselling author. He is the medical director of Amen Clinics, Inc. in Newport Beach and Fairfield, California, Bellevue, Washington, and Reston, Virginia, which have the world's largest database of brain SPECT studies.

Michael A. Schmidt, PhD
Dr. Schmidt did his Ph.D. research in molecular medicine within the Life Sciences Division at NASA Ames Research Center. He is a member of the Society for Neuroscience and the Metabolomics Society, and is the author of Brain-Building Nutrition and of Beyond Antibiotics: Strategies for Living in a World of Emerging Infections and Antibiotic-Resistant Bacteria (2009).

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Think only young people should lift weights? Or only pro athletes should take supplements? Think again. Celebrity exercise physiologist, Marco Borges, shatters some common workout myths for Life Extension® readers.

The roster of celebrities lining up to give credit to Marco Borges for teaching them how to live a healthy lifestyle reads like a Grammy nominations list, with Jay-Z, Beyonce Knowles, and Gwen Stefani acting as headliners. Not to mention the dozens of other business moguls, pro athletes, and readers who have seen him or his work featured in Vogue Magazine and Best Life Magazine. Now, with his book titled Power Moves: The 4 Motions to Transform Your Body for Life, Borges is quick to give credit to the philosophy, training routine, nutrition plan, and supplement regimen that got him where he is today. Beginning with the latter, he says that he relies on a huge array of Life Extension® products to maintain optimal health.
“Life Extension has the most amazing products,” Borges says. “I love the Life Extension Mix. I just switched from the tablets to the powder and I love it. I find that it’s the most comprehensive multivitamin product on the market.”

As Borges talks, he opens up his medicine cabinet and runs through a list of the products that he takes on a regular basis: ubiquinol CoQ10, lycopene, mitochondrial energy boosters, gamma tocopherols, omega-3s, resveratrol, vitamin D, glucosamine, and chondroitin.

“You guys have bar none the best research of anyone out there,” he says. “I started taking the resveratrol because of all the great research out there that I’ve come across.”

That research includes a vast array of clinical studies as well as a CBS News 60 Minutes report that highlighted some of the benefits of resveratrol, including signs that it may help slow or even reverse certain areas of the aging process. For Borges, who has plenty of clients that fall into the “middle-aged population” range, passing on knowledge about supplements like resveratrol is just one part of his total body health philosophy.

“When it comes to the aging population, I also recommend glucosamine and chondroitin,” he says.

Glucosamine is important because studies have shown that aging people tend to lose their ability to produce glucosamine, which may lead to joint pain or damage. For active individuals, this leads to a decreased range of movement, which may lead to pain and less inclination to exercise. Chondroitin is usually taken with glucosamine to facilitate its entry into the joints.

“In addition to the supplements, I’ve also noticed that as people get older they want to eat less and less,” Borges says. “Sometimes they eat so little that they start to atrophy. That’s why I recommend they take a really good protein shake. That way they’re getting at least 20 grams of protein a day to help maintain the muscle they already have.”

Of course, in order to sustain muscle mass and preserve our strength as we age, it is imperative to continue to do some type of resistance training on a regular basis. It’s in this area of physical training that Borges wants to shed the myth that weight training isn’t just for bodybuilders or young professional athletes.

“The aging population needs to understand that weight training isn’t just something you do when you’re young,” he says. “People think that if they’re in their 60s, 70s, or 80s they won’t benefit from strength training, but nothing could be further from the truth. You start losing about 1% of strength per year around age 50, so you must remain engaged in a resistance training routine or your muscles will atrophy.”

At the bare minimum, Borges recommends some sort of stretching program one to two days a week, just so people can keep their range of motion. But even if that’s all you’re going to do, he says that you still need to warm up and cool down. In order to warm-up for an exercise or a good stretch, you should go for a nice paced walk for 15 to 20 minutes. If the walk is going to be your exercise for the day, then try to at least walk at a moderate pace for a half hour.

“After a workout, I always recommend a good 10 minute slow or moderate paced walk to cool down before stretching,” Borges says. “Many aging clients want to stretch to keep range of motion, but your muscles have to be warm to reap the benefits of a good stretch. If you tried to stretch a cold muscle, that’s like putting a rubber band in the freezer. When you pull a frozen rubber band, it’s going to snap, but if you put it out in the hot sun, the rubber becomes more pliable.”

Also, if you exercise, you don’t want your muscles to cool in a knot or contracted position or you’ll wake up and feel stiff later. If you want to delay or offset soreness, Borges’ recommendation is to engage in a 15-20 minute stretching program after exercise.

He points to the fact that as we get older, we’re more susceptible to injury because of overusage of a muscle or muscle group. That’s because whatever the activity, the older you get, the more times a muscle has done a particular movement the likelihood increases that it may break down. For instance, if you play tennis and don’t stretch,
as you get older, you’ll be more susceptible to shoulder soreness and things like tennis elbow. For those of you who don’t play tennis or have a particular athletic interest, Borges says that while exercising is important, it’s just as imperative to enjoy the type of exercise that you’re doing.

“I think it’s really important to find something that you like,” he says. “If you’re looking for permanence, you can’t force yourself to do something. At the end of the day, it’s all about engaging the body. The more we move, the more we improve. I can’t begin to tell you how many people attended my bike spinning class in Florida who at first thought they couldn’t do it. People in their 60s, 70s, and 80s. They would come as a group and start at a very low resistance. Each of them moved at their own pace, so they could coexist in the same routine. Eventually, they all improved!”

If you aren’t into tennis, bicycling, golf, or a particular exercise, you can still benefit from some very basic movements. Borges suggests even doing a few sets of squat presses can be beneficial. A squat press engages the core, quadriceps, hamstrings, shoulders and calves, which makes it a near total body movement. *(See sidebar for instructions on how to do a squat press.)*

“I don’t recommend squatting too low,” he explains. “What I have my clients do is place a chair behind them and you tap the chair with your glutes and stand right back up again. This exercise is important because we lose explosiveness the older we get. Even if you’re 80 years old, you always need explosiveness. When you get out of bed or get out of a car, you want to be able to just pop up and get going. That takes explosiveness. We take it for granted until we no longer have it.”

Exercises like the squat press take only a few minutes to learn but have benefits that can last you for the rest of your life.

“For people who haven’t exercised in a while, they often have this image of the old Nautilus machines,” Borges says. “They’re not thinking creatively. With just a few simple movements done for reps several times a week and some cardiovascular exercise, aging individuals can improve and maintain their coordination, stability, and balance.”

For more information, visit www.marcoborges.com.

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

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**6 STEPS FOR A SQUAT PRESS**

1. Stand with your feet shoulder width apart. Your arms should be bent with hands at shoulder height.
2. Squat down with your hips pushed back, as if you were about to sit in a chair.
3. Continue to squat until your thighs are parallel with the ground (or your glutes touch a chair beneath you).
4. As you squat, simultaneously reach up with your arms toward the sky.
5. Slowly come back to a starting position: standing with your hands at shoulder height.
6. Repeat. Begin with 5 and build up to 15 reps.
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While most people only think of pumpkins on Thanksgiving or Halloween, the seeds of this fruit offer an impressive cocktail of health enhancing and disease fighting compounds, vitamins, and minerals that can be consumed year-round. In addition, they are packed with tryptophan and essential fatty acids.1 Emerging evidence indicates that pumpkin seeds represent a potent functional food in the battle against heart disease, osteoporosis, bladder dysfunction, anxiety, and arthritis.
Pumpkin’s History

Native to North America, pumpkins (*Cucurbita pepo*) were first embraced by Native Americans for their multi-purpose properties before the fruit’s seeds were passed along to European explorers and spread throughout Europe. Pumpkins, and their seeds known as pepitas, belong to the gourd family *Cucurbitaceae*. The United States is currently the largest producer of pumpkins followed by Mexico, India, and China.1

Improving Bladder Function

Among its unique multitude of health benefits, pumpkin seeds standout for their ability to effectively treat an overactive bladder, a condition characterized by a sudden urge to urinate that may lead to an involuntary loss of urine.2 Researchers estimate that 16% of men and women suffer from overactive bladder symptoms such as urination urgency as well as frequent daytime and night urination.3 Although an overactive bladder poses no threat to overall health, it has been shown to reduce quality of life.4

Several studies have shown compelling data in pumpkin seed extract’s ability to support bladder function and combat the symptoms associated with an overactive bladder. In an animal study published in the *Japanese Journal of Medicine and Pharmaceutical Science*, rats supplemented with pumpkin seed extract significantly improved bladder function and decreased urinary frequency.5

The promising results of pumpkin seed extract for an overactive bladder were also demonstrated in humans. Japanese scientists examined the effects of pumpkin seed and soybean germ extracts on urinary frequency during the daytime and night in 39 postmenopausal women aged 52 to 86 over a 6-week period.6 At the end of the study, participants experienced significant decreases in the number of daytime and night urinations.

In another study, 45 men aged 65 or older experienced significant reductions in nighttime urinary frequency and improved sleep satisfaction after supplementing with the combination extract for six weeks.7

Furthermore, pumpkin seeds might provide dramatic relief for aging men suffering from urinary symptoms caused by benign prostatic hyperplasia, or an enlarged prostate. Researchers revealed that 53 men ages 50-80 taking a pumpkin seed extract containing mixture for three months produced an over 40% increase in urinary flow and a 30% reduction in nighttime urinary frequency compared with those taking a placebo.8

Thwarting Heart Disease

Pumpkin seeds modulate several cardiovascular disease risk factors. In a recent study published in the *African Journal of Traditional, Complementary and Alternative Medicines*, researchers found that rats induced with atherosclerosis and supplemented with pumpkin seeds for 37 days experienced not only significant increases in protective HDL cholesterol but also a 47% decrease in total cholesterol and a 78% reduction in LDL cholesterol.9

One possible reason for pumpkin seeds LDL cholesterol lowering effects is due to its high concentration of phytosterols, plant compounds that inhibit cholesterol absorption in the small intestine.10 Pumpkin seeds have the third highest phytosterol content among nuts and seeds commonly consumed as snacks.11

While managing LDL cholesterol is often the focal point of many heart boosting regimens, research indicates that increasing HDL cholesterol might play an equally pivotal role in heart protection as higher levels have been...
Bone Protection

Pumpkin seeds are a rich source of magnesium, phosphorous, and zinc, all overlooked minerals in optimizing bone health and preventing osteoporosis. Researchers at the University of Tennessee assessed the relationship between magnesium intake and bone mineral density, a major factor in the development of osteoporosis, in over 2,000 elderly men and women aged 70-79. After taking into account confounding factors of age, calcium intake, osteoporosis status, BMI, and physical activity, researchers concluded that higher intakes of magnesium were correlated with greater bone mineral density, particularly for caucasian individuals.15 Researchers believe one possible mechanism for magnesium’s beneficial effects is its ability to promote a more alkaline environment inside bones, which has shown to be conducive to boosting bone mineral density.

In a separate study published in the journal Osteoporosis International, scientists uncovered a strong association between fracture risk and dietary intake of phosphorous and zinc in more than 6,000 men ages 46-68. After analyzing data from a 2.4 year follow-up, participants with the lowest intake of zinc and phosphorous had increased fracture risk compared with those who consumed the highest intake of both minerals.16

Easing Arthritis

Pumpkin seed oil has also shown powerful antioxidant properties that might ease inflammation associated with arthritic symptoms. In a study published in the journal Pharmacology Research, rats induced with

Nutrients Amount DV(%)  
Manganese 1.47 mg 73.5%  
Tryptophan 0.17 g 53.1%  
Magnesium 190.92 mg 47.7%  
Phosphorous 397.64 mg 39.7%  
Copper 0.43 mg 21.5%  
Protein 9.75 g 19.5%  
Zinc 2.52 mg 16.8%  
Iron 2.84 mg 15.7%  

Ways to Enjoy Pumpkin Seeds1

1. For roasted pumpkin seeds, bake them in the oven at 160 to 170°F for 15 to 20 minutes.  
2. Add pumpkin seeds to soups, stew, and meatloaf.  
3. Sprinkle them on top of salads, cereals, and yogurt.  
4. Eat them raw as a snack.

associated with a decrease in cardiovascular disease risk.12

Pumpkin seed oil has favorable effects on HDL cholesterol, according to a study reported in the journal Climacteric. Researchers randomly assigned 35 postmenopausal women 2 g of pumpkin seed oil or wheat germ oil daily for 12 weeks.13 Measurements of blood lipids and blood pressure were recorded. The results showed that the pumpkin seed oil group experienced a 16% increase in HDL cholesterol levels in addition to a nearly 7% drop in diastolic blood pressure level.13

The antihypertensive potential of pumpkin seed oil was further supported in another study. Egyptian researchers caused hypertension in rats by inhibiting nitric oxide synthase, the enzyme responsible for generating the blood pressure regulating molecule nitric oxide. The hypertensive rats were then administered pumpkin seed oil or the antihypertensive medication amlodipine daily for six weeks. Findings showed that pumpkin seed oil was as effective as amlodipine in reversing elevated blood pressure in rats by restoring nitric oxide levels close to normal.14
arthritis showed significant increased levels of inflammation that were reduced when administered pumpkin seed oil; results that compared favorably to when the rats received the non-steroidal anti-inflammatory drug indomethacin. Furthermore, the indomethacin-supplemented rats experienced increased levels of liver lipid peroxidation, an indicator of liver injury, whereas the pumpkin seed oil group experienced no side effects.17

**Anxiety Relief**

A study published in the Canadian Journal of Physiology and Pharmacology revealed that tryptophan, an amino acid abundant in pumpkin seeds, might help alleviate anxiety. Since tryptophan is converted to serotonin, a neurotransmitter that enhances mood and promotes well-being in the brain, researchers investigated whether consuming a tryptophan rich food could boost serotonin levels and reduce anxiety symptoms. They discovered that subjects with anxiety disorder who consumed tryptophan rich gourd seeds with carbohydrates before an anxiety test experienced greater improvements in subjective and objective measures on the Endler Multidimensional Anxiety Scale compared with those who consumed only carbohydrates.18

**Summary**

With a remarkable assortment of health-enhancing nutrients, from magnesium, protein, niacin, and zinc, to its high concentration of tryptophan and essential fatty acids, pumpkin seeds provide a powerful health punch that offers protection against common health problems including cardio-vascular disease and osteoporosis. It also provides powerful relief for people suffering from bladder dysfunction, anxiety, and arthritis. While pumpkin seeds are synonymous with Halloween, consider incorporating these nutritional gems into your diet on a regular basis to reap their broad-spectrum health benefits.

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

**References**

REINFORCE YOUR SKIN WITH TOPICAL Lycopene

Applied directly to the delicate tissue of the face, **Cosmesis Lycopene Cream**—with its unique combination of lycopene and extracts of green, red, and white tea—provides targeted support against the visible effects of UV radiation and oxidative stress.

**ENHANCED PENETRATION—DEEP INTO SKIN CELLS**

Only a small fraction of the lycopene you eat ever reaches your skin. Because the lycopene in raw tomatoes is tightly bound to indigestible fiber, little of it is absorbed by your body. And most of the lycopene that is ingested gets deposited in fat-rich organs such as your eyes, adrenal glands, colon, and liver—instead of your skin.

The good news is the fat soluble nature and small molecule size of this plant nutrient make it *more easily absorbed* when applied topically to the lipid-rich environment of the skin!

**Cosmesis** has created a topical lycopene formulation in an antioxidant cream format.

**ANTIOXIDANT SYNERGY—A DIFFERENCE YOU CAN SEE**

Research suggests that antioxidants work synergistically, so **Cosmesis** has incorporated a concentrated tea blend extract, containing *polypHENOL-RICH COMPONENTS OF RED, GREEN, AND WHITE TEA*!

Because of this, the protective effects of both lycopene and the tea extract bioactives can combine to support the ability of healthy human skin to maintain its normal growth and repair, while providing natural protection against free radicals, and optimal defense against the visible effects of UV radiation.

**Lycopene**—a potent antioxidant carotene—supports your body’s natural defenses against the visible signs of UV damage, oxidative stress, and premature aging by:

- **Coordinating skin cell behavior:** Lycopene can improve the operation of "gap junctions," unique channels that connect one cell to the next to facilitate communication and the passing of molecules and ions between cells.
- **Promoting normal antioxidant activity:** Lycopene is a potent scavenger of the free radicals that contribute to aging.
- **Strengthening your skin’s collagen:** Lycopene can help inhibit the activity of enzymes involved in the destruction of collagen.
- **Supporting your body’s normal protection of skin-cell DNA:** Lycopene can help support the skin’s natural ability to ease inflammation, promote cell renewal, and aid in the protection of DNA from the destructive ravages of UVB exposure.

The retail price of a 1 oz. jar of **Cosmesis Lycopene Cream** is $28. If a member buys two jars, the price is reduced to just **$19.05** a jar.

**References**


To order **Cosmesis Lycopene Cream**, call 1-800-544-4440 or visit www.Life Extension.com.
# IS IT LOW T?

**PLEASE ANSWER YES OR NO**

<table>
<thead>
<tr>
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<th>YES</th>
<th>NO</th>
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<tbody>
<tr>
<td>1. DO YOU HAVE A DECREASE IN LIBIDO (SEX DRIVE)?</td>
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<td>2. DO YOU HAVE A LACK OF ENERGY?</td>
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<td>3. DO YOU HAVE A DECREASE IN STRENGTH AND/OR ENDURANCE?</td>
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<td>4. HAVE YOU LOST HEIGHT?</td>
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<td>5. HAVE YOU NOTICED A DECREASED “ENJOYMENT OF LIFE?”</td>
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<tr>
<td>6. ARE YOU SAD AND/OR GRUMPY?</td>
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<td>7. ARE YOUR ERECTIONS LESS STRONG?</td>
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<td>8. HAVE YOU NOTICED A RECENT DETERIORATION IN YOUR ABILITY TO PLAY SPORTS?</td>
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<td>9. ARE YOU FALLING ASLEEP AFTER DINNER?</td>
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<td>10. HAS THERE BEEN A RECENT DETERIORATION IN YOUR WORK PERFORMANCE?</td>
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If you have answered yes to #1, #7, or any three others, you may have symptoms associated with low testosterone.

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FOR HEALTHY BLADDER FUNCTION

Aging individuals frequently encounter a weakening of the bladder and its sphincter muscle that controls the release of urine. Laboratory and human clinical studies demonstrate that ingestion of water-soluble pumpkin seed extract (with soy isoflavones) can significantly improve the structural support of the bladder and the function of the sphincter muscle.

The data supporting the value of water-soluble pumpkin seed extract (with soy isoflavones) is particularly strong in studies performed in women. A clinical study of aging men also demonstrated positive results.

HOW TO USE PUMPKIN SEED-SOY EXTRACTS

The pumpkin seed has a long history of use in helping to maintain healthy bladder function. Japanese scientists have patented a method to obtain the water-soluble constituents of the pumpkin seed, which are absorbed far more efficiently into the bloodstream. These water-soluble pumpkin seed extracts appear to be the active constituents to help with the urinary discomforts endured by so many maturing women and men.

Clinical studies on women and men have used capsules containing 262 mg of water-soluble pumpkin seed extract and 50 mg of soy isoflavones taken two times each day. The results from human studies show the maximum benefits occurring after six to eight weeks of continued use.

WATER-SOLUBLE PUMPKIN SEED AND SOY EXTRACT

Based on the remarkable and consistent clinical results, Life Extension is making the identical Japanese formula used in the human studies available to its members for the first time.

A bottle containing 60 Water-Soluble Pumpkin Seed Extract with Soy Isoflavones vegetarian capsules retails for $22. If a member buys four bottles, the price is reduced to only $15 per bottle. Each capsule provides 262 mg of water-soluble pumpkin seed extract and 50 mg of soy isoflavones.

Item # 01210 Contains soybeans.

For those who are taking other soy supplements, or are allergic to soy, Water-Soluble Pumpkin Seed Extract Standalone capsules are available as well. A bottle containing 60 262 mg vegetarian capsules retails for $20. If a member buys four bottles, the price is reduced to only $13.50 per bottle. Item# 01210

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.
Blood testing provides the ultimate information regarding correctable risk factors that may predispose you to disorders such as cancer, diabetes, cardiovascular disease, and more. Information about general health and nutritional status can also be gained through standard blood analysis. Standing behind the belief that comprehensive blood testing is an important step in safeguarding your health, it is a simple process from virtually anywhere in the United States.

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1. Call 1-800-208-3444 to discuss and place your order with one of our knowledgeable health advisors. (This order form can also be faxed to 1-866-728-1050 or mailed). Online orders can also be placed at www.lifeextension.com.
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3. Have your blood drawn.
4. Your test results will be sent directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable health advisors by calling 1-800-226-2370; or review the results with your personal physician.

It’s that simple! Don’t delay—call today!

**For Our Local Members:**
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.

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<th>MOST POPULAR PANELS</th>
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<td>Pregnenolone and Dihydrotestosterone (DHT)</td>
<td>To provide an even more in-depth analysis of a man’s hormone status, Life Extension has created this panel as an add-on to the Male Life Extension Panel. This panel provides valuable information about a testosterone metabolite that can affect the prostate, and the mother hormone that acts as a precursor to all other hormones.</td>
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<td><strong>FEMALE HORMONE ADD-ON PANEL (LCADFF)</strong></td>
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<tr>
<td>Pregnenolone and Total Estrogens</td>
<td>To provide an even more in-depth analysis of a woman’s hormone status, Life Extension has created this panel as an add-on to the Female Life Extension Panel. This panel provides valuable information about total estrogen status, and the mother hormone that acts as a precursor to all other hormones.</td>
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<td><strong>FEMALE COMPREHENSIVE HORMONE PANEL</strong></td>
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* 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 $35 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.

**NOTE:** CBC/Chemistry profile is included in the Male and Female Life Extension panels and Weight Loss Panels.

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| THE CBC/CHEMISTRY PROFILE (LC381822) | **$35** |
| OVER 40 PARAMETERS TESTED | |
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| HDL Cholesterol Estimated CHD Risk | |
| LDL Cholesterol Glucose | |
| Triglycerides Iron | |
| LIVER FUNCTION PANEL | |
| AST (SGOT) Total Bilirubin | |
| ALT (SGPT) Alkaline Phosphatase | |
| LDH | |
| KIDNEY FUNCTION PANEL | |
| BUN | BUN/Creatinine Ratio |
| Creatinine | Uric Acid |
| BLOOD PROTEIN LEVELS | |
| Total Protein | Globulin |
| Albumin | Albumin/Globulin Ratio |
| BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE | |
| Red Blood Cell Count | Monocytes |
| White Blood Cell Count | Lymphocytes |
| Eosinophils | Platelet Count |
| Basophils | | |
| Polys (Absolute) | Hemoglobin |
| Lymphs (Absolute) | Hematocrit |
| Monocytes (Absolute) | MCV |
| Eos (Absolute) | MCH |
| Base (Absolute) | MCHC |
| RDW | Polynucleated Cells |
| BLOOD MINERAL PANEL | |
| Calcium | Sodium |
| Potassium | Chloride |
| Phosphorus | Iron |

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* **Hemoglobin A1C (HbA1C) (LC001453): $31**
  * Hemoglobin A1C evaluates long-term blood sugar control. Serum glucose sometimes reacts with important proteins in the body rendering them nonfunctional. Since this process, known as glycation is one of the leading theories of aging, Life Extension believes everyone should check their A1C level.

* **Vitamin D (250H) (LC081950): $47**
  * This test is used to rule out vitamin D deficiency as a cause of bone disease. It can also be used to identify hypercalcemia.

* **Food Safe Allergy Test (LCM73001): $174**
  * This test measures delayed (IgG) food allergies for 95 common foods.

* **AspirinWorks™ (LC501620): $149**
  * Taking aspirin to prevent heart attack? Is it working? This is a random urine test used to measure your resistance to aspirin.

* **Omega Score™ (LCOMEGA): $131.25**
  * Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.

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  * This test is used to check the blood level of CoQ10 and will enable more precise dosing for anyone seeking to achieve and maintain high levels of this critical antioxidant.
**Other Popular Panels Life Extension Member Pricing**

- **ENERGY PROFILE (LC100005)**
  CBC/Chemistry Profile (see description), Epstein–Barr Virus antibodies (IgG and IgM), Cytomegalovirus Antibodies (IgG and IgM), Ferritin, Total and Free Testosterone, DHEA-S, Free T3, Free T4, Cortisol, C-Reactive Protein (high sensitivity), Vitamin B12, Folate, Insulin.
  $375

- **ANEMIA PANEL (LC100006)**
  CBC/Chemistry Profile (see description), Ferritin, Total Iron Binding Capacity (TIBC), Vitamin B12, Folate, Reticulocyte Count.
  $86

- **INFLAMMATION PANEL (LC100007)**
  CBC/Chemistry Profile (see description above), C-Reactive Protein (high sensitivity), Sedimentation Rate, Rheumatoid (RA) Factor, Antinuclear Antibodies (ANA) Screen.
  $135

- **THYROID ANTIBODY PROFILE (LC100004)**
  Thyroid Antithyroglobulin Antibody (ATA) and Thyroid Peroxidase Antibody (TPD).
  $99

**Popular Single Tests**

- **HORMONES**
  - **CORTISOL** (LC004511)
    This test is to measure adrenal function.
    $39
  - **DHEA-SULFATE** (LC004020)
    This test shows if you are taking the proper amount of DHEA. This test normally costs $100 or more at commercial laboratories.
    $61
  - **DIHYDROTESTOSTERONE (DHT)** (LC500142)
    Measures serum concentrations of DHT.
    $99
  - **ESTRADIOL** (LC004515)
    For men and women. Determines the proper amount in the body.
    $33
  - **INSULIN FASTING** (LC004333)
    Can predict those at risk of diabetes, obesity, and heart and other diseases.
    $42
  - **PREGNENOLONE** (LC140707)
    Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing’s syndrome.
    $116
  - **PROGESTERONE** (LC004317)
    Primarily for women. Determines the proper amount in the body.
    $55
  - **SEX HORMONE BINDING GLOBULIN (SHBG)** (LC802016)
    This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.
    $33
  - **SOMATOMEDIN C (IGF-1)** (LC010363)
    Indicates growth hormone secretion levels. Low levels have been associated with atherosclerosis as well as all-cause mortality.
    $75

**CARDIAC RISK**

- **Lp-PLA2 (PLAC TEST)** (LC123240)
  This test is used to aid in predicting risk for coronary heart disease, and ischemic heart disease associated with atherosclerosis. Lp-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.
  $25

- **C-REACTIVE PROTEIN (HIGH-SENSITIVITY)** (LC120766)
  Measures inflammation factors in arteries. Recent studies indicate that C-reactive protein may be the most accurate risk factor for predicting heart attack and stroke.
  $42

- **CARCINOMA PLUS** (LC100009)
  CBC/Chemistry profile (see description), Vitamin D 25-hydroxy, C-Reactive Protein (high sensitivity), Fibrinogen, Homocysteine.
  $145

- **VAP PLUS** (LC100008)
  VAP, C-Reactive Protein (high sensitivity), Homocysteine, Fibrinogen, PLAC Test (Lp-PLA2), Vitamin D 25-hydroxy.
  $330

- **FIBRINGEN** (LC001610)
  High levels of this blood-clotting factor increase the risk of heart attack and stroke.
  $31

- **HOMOCYSTEINE** (LC706994)
  Can indicate if you are likely to have a heart attack or stroke. Even if you take folic acid, you still may have dangerously high levels of this artery-clotting metabolic debris that can be lowered with high doses of TMC, vitamin B6, and vitamin B12.
  $64

- **VAP™ TEST** (LC804500)
  The VAP cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. Direct measurements, not estimations, are provided for total cholesterol, LDL, HDL, VLDL, and cholesterol subclasses.
  $90

**MALE HEALTH**

- **PSA (PROSTATE-SPECIFIC ANTIGEN)** (LC010322)
  Can provide an early warning sign for prostate disorders and possible cancer.
  $31

- **FREE-PSA (INCLUDES TOTAL PSA)** (LC480780)
  Recommended to determine if an elevated PSA is indicative of prostate cancer.
  $61

**BONE HEALTH**

- **OSTEOCALCIN** (LC010249)
  Osteocalcin is often used as a biochemical marker, or biomarker, for the bone formation process. It has been routinely observed that higher serum osteocalcin levels are relatively well correlated with bone diseases characterized by increased bone turnover, especially osteoporosis.
  $91

**DIOXPYRIDINOLINE CROSS LINK URINE TEST** (LC511105)

- **The deoxypyridinoline (DPD) urine test can be used to measure bone re-absorption rates in healthy individuals and in those with enhanced risk of developing metabolic bone diseases. Deoxypyridinoline can be used to monitor therapies (which may include bisphosphonate drugs) in people diagnosed with osteoporosis.**
  $79

**TERMS AND CONDITIONS**

This blood test service is for informational purposes only and no specific medical advice will be provided. National Diagnostics, Inc., and the Life Extension Foundation contract with a physician who will order your test(s), but will not diagnose or treat you. Both the physician and the testing laboratory are independent contractors and neither National Diagnostics, Inc., nor the Life Extension Foundation™ will be liable for their acts or omissions. Always seek the advice of a trained health professional for medical advice, diagnosis, or treatment. When you purchase a blood test from Life Extension/National Diagnostics, Inc., you are doing so with the understanding that you are privately paying for these tests. There will be absolutely no billing to Medicare, Medicaid, or private insurance. I have read the above Terms and Conditions and understand and agree to them.

Signature of Life Extension Member

X

Life Extension Foundation Members only

MEMBER NO.

- Male
- Female

Name

Date of Birth (required) / / 

Address

City

State Zip

Phone

Credit Card No.

Expiration Date / 

Mail your order form to:

Life Extension National Diagnostics, Inc.
3600 West Commercial Boulevard
Fort Lauderdale, FL 33309

Phone your order to: 1-800-208-3444
Fax your order to: 1-866-728-1050

Blood tests available only in the continental United States.

For non-member prices call 1-800-208-3444
SKIN CARE
Advanced Under Eye Serum with Stem Cells
Amber Self MicroDermAbrasion
Anti-Aging Mask
Anti-Glycation Serum
Antioxidant Rejuvenating Foot Cream
Antioxidant Rejuvenating Foot Scrub
Antioxidant Rejuvenating Hand Cream
Antioxidant Rejuvenating Hand Scrub
Antioxidant
Redness & Blemish Lotion
Bio-Collagen w/ Patented UC-II™
Broccoli Sprout
Corrective Clearing Mask
DermaWhey
DNA Repair Cream
Dual-Action MicroDermAbrasion
Elastin Collagen Body Firming Lotion
Essential Plant Lipids Reparative Serum
Face Master® Platinum
Face Rejuvenating Antioxidant Cream
Enhanced FernBlock⁶ with Sendara™
Fine Line-Less
Hair Suppress Formula
Healing Formula All-in-One Cream
Healing Mask
Hyaluronic Facial Moisturizer
Hydrating Anti-oxidant Face Mist
Hydroderm⁴
Lavilin Underarm Deodorant
Lifting & Tightening Complex
LifeShield® Reishi
Lycopene Cream
Melatonin Cream
Mild Facial Cleanser
Neck Rejuvenating Antioxidant Cream
Peel Off Cleansing Mask
Pigment Correcting Cream
(Ultra) Rejuvenex®
Rejuvenex® Body Lotion
Rejuvenex® Factor
Rejuvenex® Factor Firming Serum
Rejuvenating Serum
Resarvetrol Anti-Oxidant Serum
Skin Lightening Serum
Skin Restoring Ceramides w/Lipowheat™
Skin Stem Cell Serum
Stem Cell Cream w/Alpine Rose
Supercritical Omega 7™
Total Sun Protection Cream
Ultra Rejuvenex®
Ultra RejuveNight® w/ Progesterone
Ultra RejuveNight® w/o Progesterone
Ultra Lip Plumper
Ultra Wrinkle Relaxer
Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Serum
Vitamin D Lotion
Vitamin E-ssential Cream
Vitamin K Healing Cream

SOY
Natural Estrogen w/Pomegranate
Soy Protein Concentrate
Super Absorbable Soy Isoflavones
Ultra Soy Extract

SPECIAL PURPOSE FORMULA
Anti-Alcohol Antioxidants w/HepatoProtection Complex
Benfotiamine w/Thiamine
Breast Health Formula
Butterbur Extract w/Standardized Rosmarinic Acid
Chlorellla
Chlorophyllin w/Zinc
Cleanse Smart
Green Coffee Extract CoffeeGenic™ (also w/ Glucose control)
Coriolus Super Strength
CR Mimetic Longevity Formula
Cistusline w/InSea™ and Crominex® 3+ EDTA
European Leg Solution Diosmin 95
Fem Dophilus
Femmesence MacaPause®
Flush & Be Fit
GlucOFit™

Hearos™ Ear Plugs
Ideal Bowel Support 299
Maitake SX-Fraction™
Migra-seze™
Natural Female Support
Organic Total Body Cleanse
Pecta-Sol®
Potassium Iodide
POQ Caps with BioPOQ™
PteroPure™
Prelox® Natural Sex for Men®
Pyridox 5'- Phosphate
Rosmarinic Acid Extract
Ultra Natural Prostate w/ AprèsFlex™ and Standardized Lignans

SPORTS PERFORMANCE
Creatine Capsules
Creatine Powder
Enhanced Life Extension Protein
DMG (N, N-dimethylglycine)
Inosine
L-Glutamine Capsules
L-Glutamine Powder

VITAMINS
Ascobic Acid Powder
Ascorbyl Palmitate Capsules
B1
B2
B12
Beta-Carotene
Biotin Capsules
Biotin Powder
Buffered Vitamin C Powder
Complete B Complex
Folic Acid + B12
Gamma E Tocopherol w/Sesame Lignans
Gamma E Tocopherol/Tocotrienols
Inositol Capsules
Inositol Powder
Mega Lycopene Extract
Methylcobalamin
MK-7
No-Flush Niacin
Optimized Folate
PABA Capsules
Super Ascorbate C Capsules
Super Ascorbate C Powder
Super K w/Advanced K2 Complex
Supercritical Omega 7™
Tocotrienols w/Sesame Lignans
Vitamin A Nutrasorb
Vitamin B3 (Niacin) Capsules
Vitamin B6
Vitamin B12 Tablets
Vitamin C
Vitamin D
Vitamin D3
Vitamin D3 w/Sea-Iodine™
Vitamins D and K w/ Sea-Iodine™
Vitamin E
Vitamin K1

WEIGHT MANAGEMENT
All™ Refill Pack
Advanced Anti-Adipocyte Formula w/AdipoStat & Integra Lean™
Anti-Adipocyte Formula w/AdipoStat
Calorie Control Weight Management Formula w/ CoffeeGenic™ Green Coffee Extract
7 Keto DHEA
DHEA® Complete
FucoAthin Slim™
HCA
Integra-Lean® Irvingia
LunaLean® Caps Special Propolmannan Particle Size
Optimized Irvingia w/ Phase 3™ Calorie Control
Optimized Saffron w/ Satireal™
Natural Appetite Control
Natural Glucose Absorption Control
Stevia Liquid Extract
Super CLA Blend w/ Guarana and Sesame Lignans
Super CLA Blend w/Sesame Lignans
Udo’s Choice Wholesome Fast Food Blend
WellBetX PGX® Soluble Fiber Blend

Floravital® Iron & Herbs
Iodoral
Iron Protein Plus
Magnesium
Magnesium Citrate
Mineral Formula for Men
Mineral Formula for Women
Only Trace Minerals
Optimized Chromium w/Crominex® 3+
OptiZinc
Sea-Iodine™
Se-Methyl L-Selenocysteine
Selenium
Vanadyl Sulfate
Zinc/Vitamin C Lozenges

MISCHELLEANEOUS
Blender
Blood Pressure Monitor Arm Cuff Medium
Cell Sensor Gauss Meter™
CFR Advanced Dietary Software
Empty Gelatin Capsules
Blood Pressure Monitor Arm Cuff Medium
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<th>ACETYL-L-CARNITINE - 500 mg, 100 caps</th>
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<th>Member Each</th>
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<td>*46925</td>
<td>ALL** REFILL PACK - 120 caps</td>
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<td>ALOE VERA FRESH** - 60 veg. caps</td>
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<td>ANTI-ALCOHOL ANTIOXIDANTS w/HEPATOPRO - 100 caps</td>
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<td>ANTI-APOPCYTE FORMULA w/ADIPOSTAT - 60 veg. caps</td>
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<td>01509</td>
<td>ANTI-APOPCYTE FORMULA w/ADIPOSTAT &amp; INTEGRA LEAN*(ADVANCED) - 60 veg. caps</td>
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<td>APPLEYESE POLYPHENOL EXTRACT - 600 mg, 30 veg. caps</td>
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<td>01039</td>
<td>ARGinine/ORNithine - 500/250, 100 caps</td>
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<td>00358</td>
<td>ARGinine/ORNithine POWder - 150 grams</td>
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<td>17.21</td>
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<td>01624</td>
<td>(L)-ARGinine caps - 700 mg, 200 veg. caps</td>
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<td>19.88</td>
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<td>01025</td>
<td>(L)-ARGinine FREE-FORM POWder - 100 grams</td>
<td>15.98</td>
<td>11.99</td>
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<tr>
<td>01617</td>
<td>ARTHROMAX** w/THEAFLAVINS &amp; APRESFlex** - 120 veg. caps</td>
<td>44.00</td>
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<td>ARTHROMAX** ADVANCED w/UC-II &amp; APRESFlex** - 60 veg. caps</td>
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<td>01404</td>
<td>ARTHRO-IMMUNE JOINT SUPPORT - 60 veg. caps</td>
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<td>ASCORBIC ACID POWder - 454 grams</td>
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<td>00852</td>
<td>ASCORBYL PALMITATE - 500 mg, 100 caps</td>
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**SUB-TOTAL OF COLUMN 1**

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<td>01066</td>
<td>ASPIRIN - 81 mg, 300 enteric coated tablets</td>
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**SUB-TOTAL OF COLUMN 2**

*OCTOBER 2012*  
LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

To order call: 1.954.766.8433 or 1.800.544.4440
<table>
<thead>
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Buyers Club Order Form

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To order call: 1.954.766.8433 or 1.800.544.4440

SUB-TOTAL OF COLUMN 5

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SUB-TOTAL OF COLUMN 6

OCTOBER 2012

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
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**Sub-Total of Column 7**

**Sub-Total of Column 8**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

OCTOBER 2012
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<tr>
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<td>GREEN TEA EXTRACT (MEGA) - decaffeinated - 100 veg. caps</td>
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<td>5-HTP - 100 mg, 60 caps</td>
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<td>HAIR CONDITIONER - 16 oz</td>
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<td>HCA - 90 caps</td>
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<td>HEAROS® EAR PLUGS - 1 pack - small size</td>
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<td>HEPATOMDO - 900 mg, 60 softgels</td>
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<td>HOLY BASIL - 60 softgel caps</td>
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<td>HOLY BASIL - 120 softgel caps</td>
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<td>HOMOCYSTEINE RESIST - 100 caps</td>
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<td>*I26® HYPERIMMUNE EGG - 135 capsules</td>
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<td>*I26® HYPERIMMUNE EGG CHEWABLES - (vanilla) 45 tablets</td>
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<td>IDEAL BOWEL SUPPORT 29V - 30 veg. caps</td>
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<td>00955</td>
<td>IMMUNE PROTECT W/PARACTIN® - 30 veg. caps</td>
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**SUB-TOTAL OF COLUMN 9**

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<th>Qty</th>
<th>Total</th>
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<td>INNERPOWER™ - 555 grams powder</td>
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<td>00108</td>
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<td>01292</td>
<td>INTEGRA-LEAN® IRVINGIA - 150 mg, 60 veg. caps</td>
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<td>(WOD) KRILL OIL - 60 softgels</td>
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<td>01665</td>
<td>LIFE EXTENSION MIX™ - 315 tablets w/copper</td>
<td>98.00</td>
<td>73.50</td>
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**SUB-TOTAL OF COLUMN 10**
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<td>Buy 4 bottles, price each</td>
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<td>Buy 10 bottles, price each</td>
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<td>01666</td>
<td>LIFE EXTENSION MIX™ POWDER - 14.81 oz w/o copper</td>
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<td>73.50</td>
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<td></td>
<td>Buy 4 bottles, price each</td>
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<td>Buy 10 bottles, price each</td>
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<td>LIFE FLORA™ - 300 mg, 120 caps</td>
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<td>LIFESHIELD® CORGYCEPS - 60 veg. caps</td>
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<td>LIFESHIELD® REISHI™ - 60 veg. caps</td>
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<td>01608</td>
<td>LIVER EFFICIENCY FORMULA - 30 veg. caps</td>
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<td>LIVER FORCE - 60 veg. caps</td>
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<td>01639</td>
<td>5-LOX INHIBITOR W/ APRESOL™ - 100 mg, 60 veg. caps</td>
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<td>Buy 4 bottles, price each</td>
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<td>15.00</td>
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<td>L-LYSINE - 620 mg, 100 caps</td>
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<tr>
<td>00129</td>
<td>L-LYSINE POWDER - 300 grams</td>
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<td>13.75</td>
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<td>LURALEAN® CAPS SPECIAL PROPOLMANNAN PARTICLE SIZE - 120 veg. caps</td>
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<td>Buy 4 bottles, price each</td>
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<td>Lycopene EXTRACT (MEGA) - 15 mg, 90 softgels</td>
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<td>Buy 4 bottles, price each</td>
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<td>01369</td>
<td>MAGNESIUM CAPS - 500 mg, 100 veg. caps</td>
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<td>Buy 4 bottles, price each</td>
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<td>00502</td>
<td>MAGNESIUM CITRATE - 160 mg, 100 caps</td>
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<td>Buy 4 bottles, price each</td>
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<td>Maitake™ SX-FRACTION - 90 veg. tablets</td>
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<td>MELATONIN - 300 mcg, 100 caps</td>
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<td>Buy 4 bottles, price each</td>
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<td>MELATONIN - 500 mcg, 200 veg. caps</td>
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<td>Buy 4 bottles, price each</td>
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<td>MELATONIN - 1 mg, 60 caps</td>
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<td>Buy 4 bottles, price each</td>
<td>4.63</td>
<td>3.47</td>
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<tr>
<td>00330</td>
<td>MELATONIN - 3 mg, 60 caps</td>
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<td>Buy 4 bottles, price each</td>
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<td>MELATONIN - 3 mg, 60 time-release veg. caps</td>
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<td>00331</td>
<td>MELATONIN - 10 mg, 60 caps</td>
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<td>MELATONIN - 3 mg, 60 lozenges</td>
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<td>5.16</td>
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<td>MELATONIN TIME RELEASE - 300 mcg, 100 veg. caps</td>
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<td>MELATONIN TIME RELEASE - 750 mcg, 60 veg. caps</td>
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**SUB-TOTAL OF COLUMN 11**

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<th>Qty</th>
<th>Total</th>
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<tr>
<td>01009</td>
<td>MEMORY UPGRADE™ - 600 grams powder</td>
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<tr>
<td>01538</td>
<td>METHYLCOBALAMIN - 1 mg, 60 lozenges (vanilla)</td>
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<td>7.46</td>
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<td>01537</td>
<td>METHYLCOBALAMIN - 5 mg, 60 lozenges (vanilla)</td>
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<td>24.00</td>
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<td>01522</td>
<td>MILK THISTLE (CERTIFIED EUROPEAN) - 750 mg, 60 veg. caps</td>
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<td>01517</td>
<td>MILK THISTLE (CERTIFIED EUROPEAN) - 120 veg. caps</td>
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<td>00633</td>
<td>MINERAL FORMULA FOR MEN - 100 caps</td>
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<td>MITOCHONDRIAL BASICS w/ BIOPQQ™ - 30 caps</td>
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<td>01568</td>
<td>MITOCHONDRIAL ENERGY OPTIMIZER w/ BIOPQQ™ - 120 caps</td>
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<td>00810</td>
<td>MIST ORAL III w/ CQ10 - 2 fl oz</td>
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<td>MK-7 - 90 mcg, 60 softgels</td>
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<td>01279</td>
<td>MOUTHWASH W/ POMEGRANATE - 16 oz</td>
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**SUB-TOTAL OF COLUMN 12**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

October 2012
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<th>Product Description</th>
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**SUB-TOTAL OF COLUMN 13**
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**Q, R**

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**SUB-TOTAL OF COLUMN 15**

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**SUB-TOTAL OF COLUMN 16**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

OCTOBER 2012
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SUB-TOTAL OF COLUMN 19

* These products are not 25% off retail price.
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☐ Charge my cc: ______________________

Card # ______________________ Exp. ______________
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C.O.D.s (Add $7 for C.O.D. orders)  
Shipping  
GRAND TOTAL (Must be in U.S. dollars)

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- **Retail**
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Human culture has evolved with mushrooms and many societies have relied on mushrooms to provide a wholesome food source. Over thousands of years of trial and error, many cultures have also discovered health benefits associated with consuming mushrooms. These health benefits are almost as broad as those found in the plant kingdom—and range from immune and respiratory support to promoting healthy liver and brain function.*

Societies soon discovered mushrooms can boost vitality, wellness, endurance, and even sexual function.* Today, more than fifty years of research has confirmed that mushrooms are indeed a unique class of natural therapeutics capable of addressing a wide range of health concerns.

Mushrooms and Humans

Mushrooms were long-conceived to be members of the plant kingdom, but closer inspection revealed that they share more similarities with animals. Hence, they were assigned their own kingdom—the fungal kingdom. While plants manufacture their own food source from the sun (photosynthesis), mushrooms must find and absorb their food from their environment—just like humans. Mushrooms must also adapt to their environments and protect themselves. In doing so, they produce a large array of protective compounds designed to defend against any invaders—also like humans. Incredibly, when humans consume these novel mushroom-derived compounds, our defenses against the environment are also enhanced.

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Whether you’re looking to support immune function, lung function, vitality, or detoxification, for many people the bottom line is potency. New Chapter LifeShield Mushrooms are the first and only full line of mushrooms that can assure a minimum 15% level of beta-glucans. That’s important, because beta-glucans are one of the most researched components of mushrooms and have been shown to play a significant role in activating key cells that are part of the immune system’s first line of defense.*

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Creating a breakthrough line of tonic mushrooms doesn’t end with selecting the finest strains. It starts there. That’s why each LifeShield Mushroom product is formulated with a superior strain that has been selected for the highest growth potential, organically grown and crafted exclusively in the USA.

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Food for Thought

JARROW FORMULAS® PhosphOmega® and LIFE EXTENSION® Cognitex®
Together Nourish the Brain

DHA + EPA and the Brain
Two members of the omega-3 family of fatty acids, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), are especially noted for their health supporting properties. In particular, DHA is the predominant omega-3 fatty acid found in the brain, nervous system and retina. In fact, DHA makes up approximately 40% of the polyunsaturated fatty acids in the brain and roughly 60% in the retina. DHA is so important that the body is able to recognize it and transport it to the nervous system. The prevalence of DHA in brain cell membranes is associated with the fluidity and function of those membranes. In addition, both DHA and EPA are associated with a healthy inflammatory response.

PhosphOmega® is a rich source of DHA and EPA bound to phospholipids. This is the form that is typical of the human brain and also typical of much omega-3-rich seafood. In other words, PhosphOmega® is brain food.

Phospholipid Delivery for a Better Omega-3
PhosphOmega® provides omega-3 fatty acids as nature intended, as a complex of phospholipids with DHA and EPA acting synergistically at the cell membrane level.* Most fish oil products consist of ethyl ester (EE) or triglyceride forms.* Phospholipid-bound omega-3s are better absorbed and utilized than are the EE or triglyceride forms. And phospholipid-bound omega-3s are much more stable — more resistant to oxidation and rancidity — than are the EE or triglyceride forms. Astaxanthin is included in PhosphOmega® to provide added protection for stability and freshness. PhosphOmega®'s purity and quality meet or exceed the standards set by two standards governing bodies, the Council for Responsible Nutrition (CRN) and the Global Organization for EPA and DHA omega-3s (GOED).

Cognitex® for Cutting Edge Nutrients
Cognitex® with NeuroProtection Complex provides nine cutting-edge brain boosting ingredients. One of these, uridine-5'-monophosphate (UMP), is a basic building block of RNA/DNA as well as of phospholipids, such as phosphatidylcholine, that are critical to brain function and the health of neuronal cell membranes.

To bolster UMP's impact on brain function, Cognitex® contains Sharp-PS® GOLD to promote normal neuronal cell membrane activities and structure. With this structure in place, vinpocetine enhances circulation and oxygenation of brain cells while phospholipid-grape seed extract improves blood vessel tone and elasticity, thus boosting oxygen flow to the brain. Cognitex® also includes L-alpha glyceryl phosphoryl choline to boost acetylcholine and Sensoril® ashwagandha extract to boost brain function. Wild blueberry extract is included to protect against free-radical damage, and pregnenolone has shown beneficial properties, as well. Pregnenolone and standardized extracts of hops, ginger and rosemary round out the formula. Cognitex® supplies nine key ingredients to enhance neuronal communication and support cognition and memory.

To order PhosphOmega® and Cognitex®, call 1-800-544-4440 or visit www.LifeExtension.com

www.Jarrow.com

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Comprehensive VITAMIN K Formula

There are three forms of vitamin K that the human body can utilize to promote arterial health and bone support.¹⁻⁸ Life Extension’s Super K with Advanced K2 Complex provides the dynamic trio of vitamin K forms in one softgel, including vitamin K1, vitamin K2 (MK-4), and vitamin K2 (MK-7).

Vitamin K1 is the form of vitamin K that is found in green vegetables. K1 is tightly bound to plant fiber, so only a fraction is absorbed into the bloodstream. Supplementation ensures ample K1 blood levels.

Vitamin K2 is usually found in meats, dairy, and egg yolks. Since you may be avoiding these foods for health reasons, ingesting a K2 supplement is essential. MK-4 is the most rapidly absorbed form of K2, and MK-7 boasts a very long half-life in the body, making both forms the perfect complement to any vitamin K regimen.⁹

Each bottle of Super K lasts 90 days, so members pay as little as $5.75 a month for this high-potency blend of all three active forms of vitamin K. The retail price for a bottle containing 90 softgels is $26. If a member buys four bottles, the price is reduced to just $17.25 per bottle.

The same Super K formula consisting of Vitamin K1, K2 (MK-4) and K2 (MK-7) can be found in the Life Extension Super Booster. If you take the Super Booster, you do not need additional Super K with Advanced K2 Complex softgels. Contains tree nuts (coconut).

Warning to Coumadin (warfarin) Drug Users
Patients prescribed vitamin K-antagonist anti-coagulant prescription drugs like warfarin should consult their physician before taking vitamin K supplements like Super K and Super Booster. There is evidence, however, that users of drugs like warfarin could benefit from a consistent low dose of supplemental vitamin K. Ask your doctor if you can take a low dose (30 mcg a day) of vitamin K2 in the long-acting MK-7 form for the purpose of stabilizing your INR levels and also protecting your body against long-term vitamin K deficit. Do not initiate any form of vitamin K supplementation without full cooperation of your treating doctor, as your doctor may need to increase your dose of warfarin to compensate for the vitamin K you supplement with. Life Extension provides several forms of low-dose vitamin K for physician consideration.

To order Super K with Advanced K2 Complex or Super Booster, call 1-800-544-4440 or visit www.LifeExtension.com

References
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Jay Kimball was sentenced to 13 years in prison for exporting a low-cost anti-aging drug. We urge you to sign an on-line petition asking President Obama to commute this wrongful jail sentence.

44 GLUCOSE CONTROL CAN BE EASY
After-meal surges in blood glucose induce oxidative stress that impairs endothelial function, reduces arterial blow flow, and increases risk for cardiovascular diseases. Take control of your blood sugar levels and stop dangerous post-meal glucose surges.

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