

RELENTLESS COMMITMENT TO REVERSE HUMAN AGING

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The ULTIMATE Source For New Health And Medical Findings From Around The World

February 2011

REMARKABLE CELL RENEWAL BENEFITS OF PQQ

**Why Ceramides
Protect More Than
Just the Skin**

**Broad-Spectrum
Defense with
Novel Berry Extract**

**Take Control of Your
Blood Sugar Level**

**Suzanne
Somers**
“Sexy Forever”

\$4.99



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SUPER SALE

The annual **SUPER SALE** enables members to obtain premium grade supplements at prices substantially **below** what commercial companies charge.

When members buy products from the **Life Extension Foundation Buyers Club**, they know that the **quality** of the products are backed by the organization's commitment to achieving an indefinitely extended life span. What follows are a few examples of the **savings** members enjoy during the **SUPER SALE**.

Retail	Member SUPER SALE Discount Price Per Bottle
Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract 120 softgels, Item # 01482	\$32 \$16.81 (ten-bottle purchase)
Super-refined EPA/DHA fish oil plus sesame lignans and potent olive fruit extract to provide critical omega-3 fatty acids and essential components of the Mediterranean diet	
PQQ Caps with BioPQQ™ , 10 mg, 30 vegetarian capsules, Item # 01500	\$24 \$14.85 (four-bottle purchase)
Promotes mitochondrial biogenesis (generation of new mitochondria)	
Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ \$62 100 mg, 60 softgels, Item # 01426	\$62 \$35.10 (ten-bottle purchase)
The superior ubiquinol form of CoQ10 plus an organic compound (shilajit) shown to double mitochondrial CoQ10 levels	
Calorie Control Weight Management Formula* 402 grams of powder, Item # 01493	\$56 \$29.70 (eight-bottle purchase)
Four potent ingredients to impede glucose-lipid absorption and combat age-associated weight gain	
Super Bio-Curcumin® 60 vegetarian capsules, Item # 00407	\$35 \$21.60 (four-bottle purchase)
Super-absorbable formulation promotes healthy lipid & joint function, and healthy DNA	
Ultra Natural Prostate Formula , 60 softgels, Item # 01495	\$38 \$21.60 (twelve-bottle purchase)
Most comprehensive formula to support normal urinary flow and help support healthy prostate function	
Super Zeaxanthin with Lutein, Meso-Zeaxanthin Plus Astaxanthin and C3G , 60 softgels, Item # 01586	\$42 \$25.65 (four-bottle purchase)
Supports night vision and macular density	
Life Extension Mix™ , 315 tablets, Item # 01555	\$98 \$46.91 (ten-bottle purchase)
High-potency multi-nutrient formula now with C3G, natural folate, and Crominex® 3+ at no extra cost	
Super Booster Softgels with Advanced K2 Complex 60 softgels, Item # 01380	\$42 \$25.65 (four-bottle purchase)
A convenient one-per-day capsule that includes optimal potencies of gamma-tocopherol, sesame lignans, lycopene, lutein, ginkgo, selenium, and both forms of vitamin K2	

*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.

The **SUPER SALE** extends to January 31, 2011. Members traditionally take advantage of the **SUPER SALE** to stock up on a year's supply of their favorite supplements. To place your order, call 1-800-544-4440 or visit www.lef.org (**SUPER SALE** pricing available only to members in the US, Canada, and England.)

LifeExtension®

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REPORTS



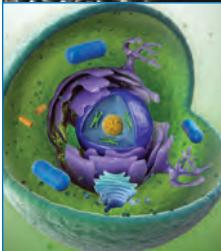
26 REMARKABLE ANTI-AGING POWER OF CERAMIDES

Molecules called **ceramides** are essential to preserving young-looking skin. It's the reason why cosmetic companies invest millions to perfect *topical* ceramide formulas. New research reveals the power of *oral* ceramides to combat a range of age-related diseases. Find out how they can improve your **cholesterol** levels, enhance **glucose control**—even combat **colon cancer**.



40 BROAD-SPECTRUM DEFENSE OF BERRY EXTRACT

Experimental models show that bolstering free radical defense nearly *doubles* life span in some species. Compounds found in dark-colored berries rank among the most **powerful** of free radical fighters in humans. Scientific interest has increasingly focused on **C3G** (*cyanidin-3-glucoside*), a berry extract that can enhance **night vision** and fight **cancer**, **heart disease**, and **metabolic disorders**.



52 GENERATE FRESH MITOCHONDRIA WITH THE "OTHER" CoQ10

Researchers have found **50% more** mitochondrial damage in the brain cells of humans over 70 compared to middle-aged individuals. The exciting news is that the coenzyme **PQQ** may combat this and other debilitating effects of age-related mitochondrial decline through **mitochondrial biogenesis**: the spontaneous growth of new mitochondria.



66 TAKE CONTROL OF YOUR BLOOD SUGAR LEVELS

Scientists have known for more than 50 years that chromium *insufficiency* directly contributes to high blood sugar. **Life Extension®** members now know that even *slightly* elevated glucose inflicts lethal, systemic damage. The good news is a **cutting-edge chromium complex** has been identified that works in synergy with a set of proprietary nutrients to slash your blood sugar levels.



78 BOOK EXCERPT: SUZANNE SOMERS'S SEXY FOREVER

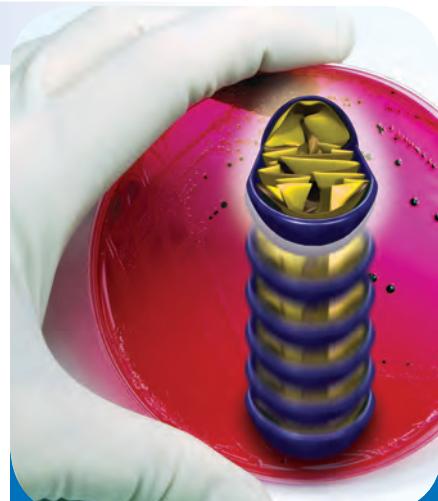
Life Extension® has published solid scientific data showing that age-related diseases can be postponed or prevented altogether. Celebrity **Life Extension®** member **Suzanne Somers's** new book, **Sexy Forever**, examines **seven** key nutrients everyone should take to safely induce long-term weight loss.

DEPARTMENTS



17 IN THE NEWS

Cinnamon extracts lower diabetes and cardiac risk factors; curcumin prevents liver damage; and more.



7 ON THE COVER

URGENT NEED TO RENEW MITOCHONDRIA

Over **350** studies published last year alone underscore what **Life Extension®** has emphasized for nearly four decades: age-related **mitochondrial dysfunction** plays a central role in virtually *all* killer diseases of aging. Specific nutrients **Life Extension®** members take, like **CoQ10**, **lipoic acid**, and **carnitine**, promote the health and function of existing mitochondria. Just as critical is the need for every aging person to generate more mitochondria in order to protect against degenerative decline. In a historic scientific breakthrough, a *natural* coenzyme called **PQQ** (*pyrroloquinoline quinone*) has been shown to trigger the formation of *new* mitochondria in aging cells!



PROFILE: JUDY COLLINS 89

Over four decades after winning her first Grammy Award, Judy Collins remains as vibrant, prolific, and energized as ever. The legendary singer-songwriter discusses some of the secrets to her vitality.

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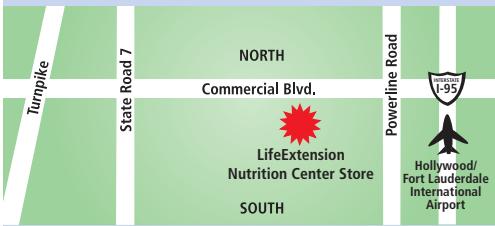
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PURE, HEART HEALTHY Super Omega-3 EPA/DHA

Fish Oil Blend with Sesame Lignans and a MORE Concentrated Olive Fruit Extract

A Comprehensive Fatty Acid Formula

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, easy-to-tolerate fish oil supplement, **Life Extension® SUPER OMEGA-3 EPA/DHA** is *molecularly distilled*. This patented process ensures any pollutants are reduced to virtually undetectable 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 rating from the world's *premiere* 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 towards pathways that help with inflammatory reactions.¹⁰

To further emulate the benefits of a **Mediterranean diet**, **Super Omega-3** delivers standardized, high-potency **olive fruit extract**. Research shows that when combined with olive oil, fish oil supplements help 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 supplies the equivalent content of **6 ounces 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 during **Super Sale**, the price is reduced to just **\$18.90** per bottle. If **10 bottles** are purchased, the cost is just **\$16.81** per bottle. Item #01482

Just four softgels of SUPER OMEGA-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract provide:

EPA Pure+™ Extract (eicosapentaenoic acid)	1400 mg
DHA Pure+™ Extract (docosahexaenoic acid)	1000 mg
Olive Fruit Extract [std. to 6.5% polyphenols (39 mg), 1.73% hydroxytyrosol/tyrosol (10.4 mg), 0.5% verbascoside/oleuropein (3 mg)]	600 mg
Sesame Seed Lignan Extract	20 mg

For those with sensitive stomachs, **Super Omega-3** is also available with **enteric coating** and retails for **\$34**. If a member buys four bottles during **Super Sale**, the price is reduced to **\$20.93** per bottle. If **10 bottles** are purchased, the cost is just **\$18.90** 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

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Contains fish (anchovy, mackerel), soybeans, and sesame.

References:

1. *Public Health Nutr.* 2006 Dec;9(8A):1136-40.
2. *Am J Prev Med.* 2005 Nov;29(4):335-46.
3. *J Am Diet Assoc.* 2005 Mar;105(3):428-40.
4. *Mini Rev Med Chem.* 2004 Oct;4(8):859-71.
5. *Nurs Stand.* 2004 Aug 11-17;18(48):38-42.
6. *Clev Clin J Med.* 2004 Mar;71(3):208-10, 212, 215-8 *passim*.
7. *J Nutr Health Aging.* 2001;5(3):144-9.
8. *Inflamm Res.* 2001 Feb;50(2):102-6.
9. *Arch Intern Med.* 2000 Mar 27;160(6):837-42.
10. *Biochem Biophys Acta.* 2004 Jun 1;1682(1-3):80-91.
11. *Nutrition.* 2005 Feb;21(2):131-6.
12. *Anal Chim Acta.* 2007 Feb 5;583(2):402-10.
13. *J Agric Food Chem.* 2007 Sep 5;55(18):7609-14.
14. *Lipids.* 2001 Nov;36(11):1195-202.
15. *Eur J Cancer.* 2000 Jun;36(10):1235-47.

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

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John Boik, PhD, is the author of two books on cancer therapy, *Cancer and Natural Medicine* (1996) and *Natural Compounds in Cancer Therapy* (2001). He obtained his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University Department of Statistics. He is currently president of New Earth BioMed, a nonprofit cancer research corporation that studies mixtures of natural products.



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



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Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Renton, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored 11 books and publishes *Nutrition and Healing*, a monthly newsletter with a worldwide circulation of more than 100,000.

World's Most Advanced RESVERATROL Formula

In 2003, the **Life Extension Foundation®** introduced a standardized extract of **resveratrol** shown to favorably alter genes implicated in the aging process—many of the same genes that respond to **calorie restriction** or **CR**.

Since then, we have gone to extraordinary lengths to identify additional compounds that simulate calorie restriction's ability to trigger youthful **gene expression**—the process by which genes transmit signals that slow certain aspects of aging.

For example, initial research funded by Life Extension showed that a combination of low-dose **resveratrol** plus **grape seed extract** induced many of the favorable gene expression changes observed in **calorie-restricted** animals.

We have since uncovered compelling evidence that certain compounds found in berries, such as **pterostilbene** and **fisetin**, also possess potent "longevity gene" activators that work in synergy with resveratrol. For example, **fisetin** (found in strawberries) has been shown to **stabilize** resveratrol in the body by shielding it from metabolic breakdown,¹⁻¹⁰ thus extending its beneficial effects.

High-Potency Resveratrol with Synergistic Activators

Life Extension members gain access to standardized **trans-resveratrol** combined with plant extracts that favorably influence longevity gene expression. Unlike many commercial formulas, Life Extension standardizes to **trans-resveratrol**, which researchers contend is the most active constituent.

A bottle containing 60 vegetarian capsules of **Optimized Resveratrol with Synergistic Grape-Berry Actives** retails for \$46. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$27.90** per bottle. The suggested dose of one capsule a day provides:

Trans-Resveratrol	250 mg
Grape-Berry Actives	85 mg
Quercetin	60 mg
Trans-Pterostilbene	0.5 mg
Fisetin	10 mg

Contains yeast.

Item #01430



References

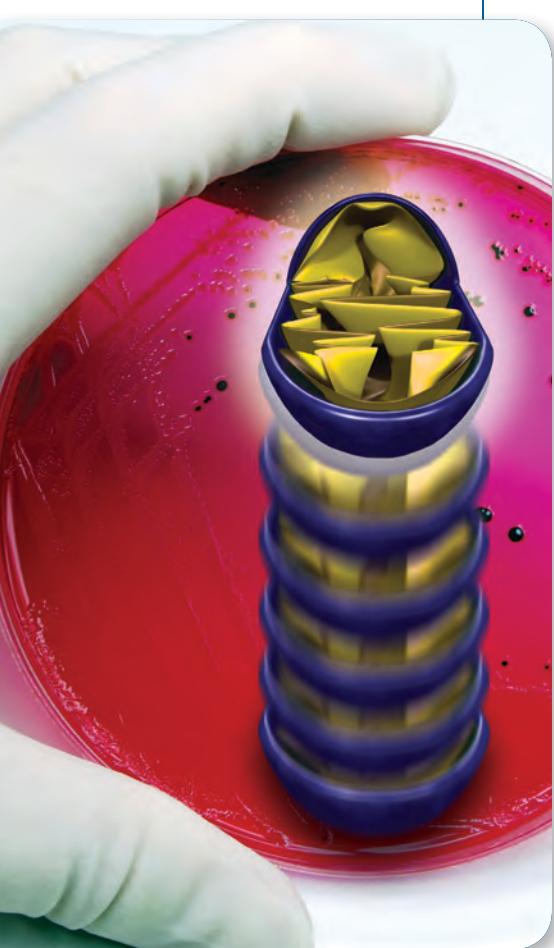
1. *Cell*. 2006 Dec 15;127(6):1109-22.
2. *Endocrinology*. 2008 Jan;149(1):84-92.
3. *Crit Care Med*. 2004 Oct;32(10):2097-103.
4. *J Agric Food Chem*. 1999 Apr;47(4):1416-21.
5. *Arch Pharm Res*. 2002 Oct;25(5):561-71.
6. *Nutr Cancer*. 1999;35(1):80-6.
7. *Anticancer Agents Med Chem*. 2006 Sep;6(5):389-406.
8. *Nature*. 2006 Nov 16;444(7117):337-42.
9. *Nature*. 2004 Aug 5;430(7000):686-9.
10. *Xenobiotica*. 2000 Sep;30(9):857-66.

To order Optimized Resveratrol, call 1-800-544-4440 or visit www.LifeExtension.com

Our Aging Mitochondria



BY WILLIAM FALOON



If you enter “**mitochondria and aging**” into the *US Library of Medicine* website, you’ll find over **351** scientific studies published in **2010**.

The consensus among researchers is that **mitochondrial dysfunction** plays a central role in the development of virtually all age-related diseases.¹

Go back nearly four decades, however, and very little about **mitochondria** appeared in medical journals. When **Life Extension®** first introduced methods to enhance mitochondrial function, few physicians understood our rationale.

Today’s scientific data make it loud and clear that every aging person should take personal responsibility to ensure optimal **mitochondrial** function and structure. The good news is that *nutrients* used by Life Extension members to enhance mitochondrial *performance* have more scientific substantiation than ever.

While compounds like coenzyme Q10,²⁻⁶ carnitine,⁷⁻⁹ and lipoic acid¹⁰⁻¹⁴ support mitochondrial function, it is critical that **new mitochondria** are generated if we are to protect against age-related decline.

Mitochondrial biogenesis is the process of creating new mitochondria within cells. Our mitochondria can be regenerated in response to intense aerobic exercise,¹⁵ calorie restriction,¹⁶ and taking certain medications like metformin.¹⁷

In **2010**, researchers at the **University of California at Davis** released a peer-reviewed publication showing that a natural compound called **PQQ** (*pyrroloquinoline quinone*) promotes the formation of new mitochondria within cells.¹⁸

For the first time, humans are empowered with a natural agent to *reverse* the deadly decline in functional **mitochondria** that underlies degenerative disease and premature aging.

AS WE SEE IT

Healthy Mitochondria Essential for the Brain

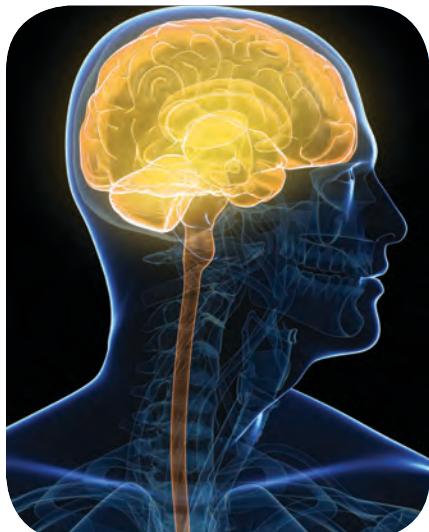
About 95% of cellular energy is produced from structures in the cell called **mitochondria**. Unlike other cell components, mitochondria are able to *divide* within healthy cells.

Mitochondria are required for cellular energy production. Impaired mitochondrial metabolism is now recognized as an underlying factor of many diseases.

The initial interest in taking nutrients like **L-carnitine** and **CoQ10** was to boost mitochondrial function in **heart** muscle cells. Overlooked was the large amount of *energy* required by **neurons** (brain cells) to carry out their specialized functions.

Studies published in **2010** (and earlier) corroborate the role of abnormal mitochondria dynamics with neuronal cell death¹⁹ and the onset of Alzheimer's,²⁰⁻²³ Parkinson's,²⁴⁻²⁶ Huntington's,²⁷⁻²⁹ and other neurodegenerative disorders.

If you live to **80 years**, there is a **30%** chance you will develop **Alzheimer's** dementia. Scientists have identified specific pathologic mechanisms that reveal the role of



mitochondrial dysfunction in the initiation and progression of this hideous disease. These findings resulted in the authors of a **2010** report concluding:

"We suggest that mitochondrial protection and subsequent reduction of oxidative stress are important targets for prevention and long-term treatment of early stages of Alzheimer's disease."³⁰

Mitochondria Dysfunction and Heart Failure

Damage to the mitochondria of endothelial cells is an underlying cause of atherosclerosis.^{31,32}

Traditional risk factors for arterial disease such as smoking,³³⁻³⁶ obesity,³⁷ high blood sugar,^{38,39} high cholesterol⁴⁰ and high triglycerides^{41,42} are all linked to mitochondrial injury.

When a person suffers persistent coronary artery blockage, a severe weakening of cardiac muscle can occur that results in **congestive heart failure**.

A study published in **2010** looked at left ventricular heart muscle tissue in patients with end-stage heart failure and normal hearts. Compared to normal hearts, mitochondrial DNA was decreased by **40%** in failing

hearts. This was accompanied by reductions of **25-80%** in mitochondrial DNA-encoded proteins of failing hearts. The doctors who conducted this study concluded:

"Mitochondrial biogenesis is severely impaired as evidenced by reduced mitochondrial DNA replication and depletion of mitochondrial DNA in the human failing heart...suggesting novel mechanisms for mitochondrial dysfunction in heart failure."⁴³

Nutrients that enhance mitochondrial function (like **coenzyme Q10** and **L-carnitine**)⁴⁴⁻⁴⁶ improve clinical and symptomatic indicators of congestive heart failure.

The ability of **PQQ** to promote **mitochondrial biogenesis**¹⁸ (formation of healthy new mitochondria) could lead to even greater improvements in cardiac output.

Dysfunctional Mitochondria Contribute to Human Cancers

In humans, it takes more than 20 years from exposure to a carcinogen before a solid tumor develops. Research published in **2010** explains the many intimate ways that **dysfunctional** mitochondria contribute to the development of cancer and its metastasis.⁴⁷⁻⁵⁵

Cancer is fundamentally connected to mitochondrial dysfunction. A decline in mitochondrial energy production with aging is associated with the generation of increased free radicals, which cause mitochondrial *mutations*.⁵⁶ These mutations interfere with a normal cell-removal process known as **apoptosis**.⁵⁷

A critical factor in protecting against cancer is the ability to eliminate damaged cells through **apoptosis**. Researchers are focusing on the huge energy-dependent processes required to eradicate faulty or abnormally growing cells. It turns out that *dysfunctional* mitochondria deny cells the ability to go through normal *apoptotic* removal processes, thus sowing the seeds for cancer initiation and progression.

In addition, mitochondria are the source for several apoptotic proteins⁵⁸ that activate cell death in the quest to eliminate damaged cells.^{59,60}

Mitochondrial dysfunction that occurs with aging plays a major influence on carcinogenesis.⁶¹ One recent study shows that mitochondrial dysfunction predicts

progression of prostate cancer in patients treated with surgery.⁴⁸

Exciting research findings indicate the potential of *reversing* mitochondrial senescence in non-tumor cells using mitochondrial-targeted antioxidants.⁶²⁻⁶⁹ The benefit is that restored healthy cells are less susceptible to tumor initiation, while cancer cells that have evolved are better controlled by **tumor suppressor genes** activated by functional mitochondrial cell-signaling.⁷⁰⁻⁷²

Mitochondria Insufficiency Promotes Type 2 Diabetes

Type 2 diabetes is often caused by overeating, but some people lose the ability to control **glucose** because of hereditary factors or physical inactivity.

A study looked at young, lean, sedentary children with *insulin resistance* whose parents had developed type 2 diabetes. Compared to similar children of non-diabetic parents, muscle biopsies showed that mitochondrial density was reduced by 38% in the offspring of diabetic parents.⁷³

This study also showed that these insulin-resistant children exhibited increased amounts of fat content in their muscles, which also contributes to insulin resistance. These findings support the concept that *hereditary* mitochondrial dysfunction contributes to the development of insulin resistance and subsequent type 2 diabetes.

The encouraging aspect to this study is that those genetically predisposed to type 2 diabetes may be able to avert this calamity through either rigorous physical exercise and/or supplementation with **PQQ**, both of which have been shown to promote **mitochondrial biogenesis**.^{15,18} (Note that certain anti-diabetic drugs like metformin and thiazolidinediones also induce mitochondrial biogenesis through additional mechanisms.)^{17,74-76}

Stem Cells Require Healthy Mitochondria

Our bodies possess remarkable ability for sustained tissue renewal throughout our lifetimes. This continuous self-renewal process is dependent on reservoirs of somatic **stem cells**.

A report published in **2010** describes how *intact* mitochondrial function is crucial for maintenance of stem cells. In response to mitochondrial impairment, there is an increase in damaging free radicals accompanied by stem cell compromise.⁷⁷

Researchers have discovered that stem cell populations do not necessarily decline with advancing age, but instead lose their restorative potential.⁷⁸ This *functional* stem cell decline is accompanied by organ malfunction and increased incidence of disease.

Mitochondrial *dysfunction* thus underlies a degenerative cycle that



Glucose Meter

AS WE SEE IT



robs aging humans of the renewal benefits of their own **stem cells**.

The integration of mitochondria into the core “axis of aging” has led researchers to propose that improvements in mitochondrial health (along with other cellular modulations) could yield advanced therapeutic strategies designed to rejuvenate tissues of the aged.

How Mitochondrial Structure Deteriorates

Altered (glycated) proteins can bind to mitochondria and compromise their function.^{79,80}

The accumulation of *dysfunctional* mitochondria results in a vicious cycle whereby increased oxidative and glycation reactions disable more mitochondria, eventually leading to a cell’s demise.⁸¹ The mitochondria in cells of elderly people are mostly dysfunctional, whereas young individuals have virtually no mitochondrial damage.^{82,83}

A fascinating report published in **2010** describes the lethal cascade that occurs as *inactive* mitochondria accumulate in cells and how **carnosine**, **acetyl-L-carnitine**, and **resveratrol** can protect against these longevity-shortening molecular interplays.⁸⁴

The Mitochondria and Human Health Span

The aging of the American society is upon us with an *accelerated* impact on healthcare expenditures. Conventional medicine can affix band-aids to age-related disease, but fails to correct the major underlying cause of **mitochondrial dysfunction** and the severe shortage of healthy mitochondria within the cell.

A search of scientific articles using the terms “**mitochondria and aging**” going back to the year **1980** reveals the *exponential* increase in our understanding of the role this cell organelle plays in sustaining healthy life span.

The box below shows how many published papers discuss “*mitochondria and aging*” in the early **1980s** compared to the last two years:

- For **1980** there were **54**
- For **1981** there were **64**
- For **1982** there were **58**
- For **1983** there were **64**
(This is when coenzyme Q10 was introduced to Americans)
- For **2009** there were **438**
- For **2010** there were **351**
(as of September 2010).

Life Extension members should be comforted in knowing that their use of nutrients to maintain mitochondrial integrity is being increasingly vindicated in the peer-reviewed scientific literature.

Mitochondrial biogenesis is a term used to describe the beneficial creation of new mitochondria. With the discovery of the unique properties by which **PQQ** promotes **mitochondrial biogenesis**, a missing link to the puzzle of degenerative aging has been uncovered. **PQQ** is available without the requirement of a prescription.

Life Extension Has No “Exit” Strategy

I hope you appreciate that as we move into our fourth decade, **Life Extension** has not changed its scientific mission or total service commitment to members.

The founders remain as dedicated today as they were in the 1970s to discovering validated scientific methods to forestall and reverse biological aging. While we use the year **1980** as our official starting date, the Life Extension Foundation received its tax-exempt status in **1978**, and I set up the first Life Extension laboratory in **1977**.

Contrast this to companies that buy and sell themselves over and over, with new owners seeking to extract every nickel of profit at the expense of product quality and customer service.

When you phone Life Extension, you never get a recording unless all of our representatives are busy assisting other members. We promise to not greet you with an automated menu that forces you to listen to endless taped messages and push many buttons before getting to talk to a live person.

We are sometimes approached by Wall Street investors who ask, "What is your exit strategy?" What they mean is when do you plan to "cash out" (by selling the organization to profit-hungry investors) and retire. My response is always the same: "**When we achieve biological immortality, I may consider taking some time off.**"

I can assure you there will never be an "exit" from our quest to achieve indefinite longevity.

Advanced Nutrient Formulas at Year's Lowest Prices

Life Extension members take advantage of the annual Super Sale to acquire our most up-to-date nutrient formulations at extra discounted prices.

Virtually every year, we upgrade our formulas to provide even more effective health-sustaining nutrients.

Last year we introduced a ubiquinol CoQ10 product that provides significantly higher CoQ10 levels within the cell's **mitochondria**.⁸⁵ This year we introduce **PQQ** to promote the formation of new mitochondria. PQQ is available as

a standalone product, or as a component of two novel mitochondrial support formulations.

In this month's issue, you'll learn about effective methods to maintain, protect, and improve vital mitochondrial function. The good news is that most of you have been taking proven mitochondrial-protecting nutrients for many years or decades. Members now have access to a compound (PQQ) that has been shown to induce formation of new mitochondria.

Every time you purchase a Life Extension product, you contribute to **research** aimed at extending healthy human life span. The Life Extension Foundation continues to fund a record number of scientific projects, while battling incompetent bureaucrats who seek to suffocate medical innovation.

During the traditional winter **Super Sale**, all Life Extension formulas are discounted so that members can obtain up-to-date versions at the lowest prices of the year.

Until January 31, 2011, members take advantage of Super Sale discounts to stock up on the world's most cutting-edge life-extending formulas.

For longer life,



William Faloon

References

- Wallace DC. A mitochondrial paradigm of metabolic and degenerative diseases, aging, and cancer: a dawn for evolutionary medicine. *Annu Rev Genet*. 2005;39:359–407.
- Ochoa JJ, Quiles JL, Huertas JR, Mataix J. Coenzyme Q10 protects from aging-related oxidative stress and improves mitochondrial function in heart of rats fed a polyunsaturated fatty acid (PUFA)-rich diet. *J Gerontol A Biol Sci Med Sci*. 2005 Aug;60(8):970–5.
- Matthews RT, Yang L, Browne S, Baik M, Beal MF. Coenzyme Q10 administration increases brain mitochondrial concentrations and exerts neuroprotective effects. *Proc Natl Acad Sci USA*. 1998 Jul 21;95(15):8892–7.
- Rodriguez MC, MacDonald JR, Mahoney DJ, Parise G, Beal MF, Tarnopolsky MA. Beneficial effects of creatine, CoQ10, and lipoic acid in mitochondrial disorders. *Muscle Nerve*. 2007 Feb;35(2):235–42.
- Rosenfeldt FL, Pepe S, Linnane A, et al. Coenzyme Q10 protects the aging heart against stress: studies in rats, human tissues, and patients. *Ann NY Acad Sci*. 2002 Apr;959:355–9; discussion 463–5.
- Sohal RS, Forster MJ. Coenzyme Q, oxidative stress and aging. *Mitochondrion*. 2007 Jun;7 Suppl:S103–11.
- Binienda ZK. Neuroprotective effects of L-carnitine in induced mitochondrial dysfunction. *Ann NY Acad Sci*. 2003 May;993:289–95; discussion 345–9.
- Noland RC, Koves TR, Seiler SE, et al. Carnitine insufficiency caused by aging overnutrition compromises mitochondrial performance and metabolic control. *J Biol Chem*. 2009 Aug 21;284(34):22840–52.
- Virmani A, Gaetani F, Imam S, Binienda Z, Ali S. The protective role of L-carnitine against neurotoxicity evoked by drug of abuse, methamphetamine, could be related to mitochondrial dysfunction. *Ann NY Acad Sci*. 2002 Jun; 965:225–32.
- Li CJ, Zhang QM, Li MZ, Zhang JY, Yu P, Yu DM. Attenuation of myocardial apoptosis by alpha-lipoic acid through suppression of mitochondrial oxidative stress to reduce diabetic cardiomyopathy. *Chin Med J (Engl)*. 2009 Nov 5;122(21):2580–6.



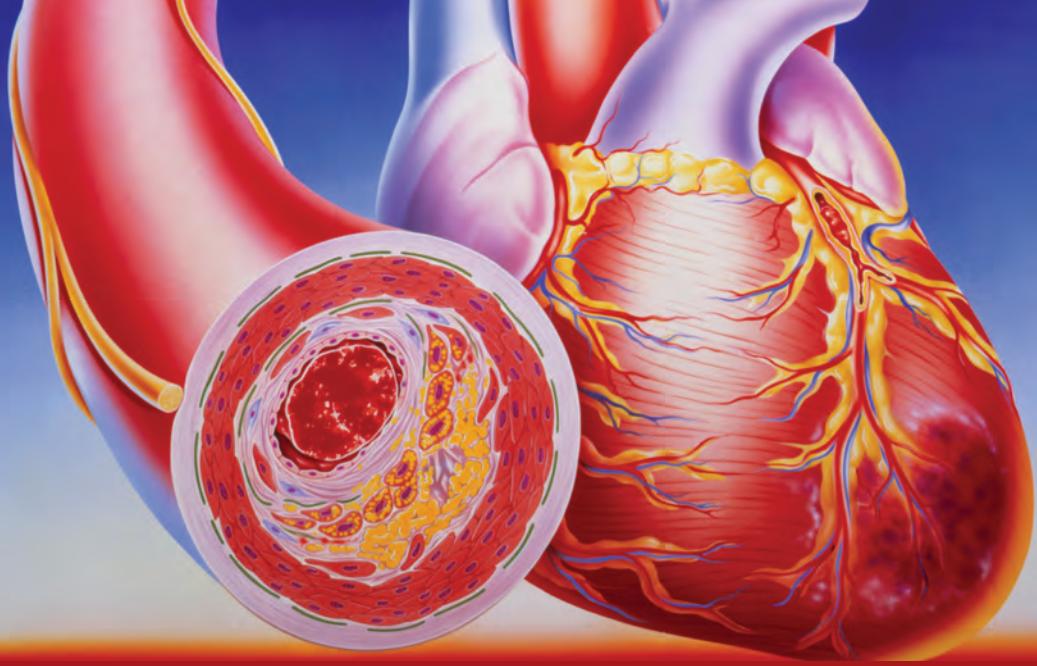
AS WE SEE IT

11. Hagen TM, Moreau R, Suh JH, Visoli F. Mitochondrial decay in the aging rat heart: evidence for improvement by dietary supplementation with acetyl-L-carnitine and/or lipoic acid. *Ann NY Acad Sci.* 2002 Apr;959:491-507.
12. Liu J, Head E, Gharib AM, et al. Memory loss in old rats is associated with brain mitochondrial decay and RNA/DNA oxidation: partial reversal by feeding acetyl-L-carnitine and/or R-alpha-lipoic acid. *Proc Natl Acad Sci USA.* 2002 Feb 19;99(4):2356-61.
13. Moreira PI, Harris PL, Zhu X, et al. Lipoic acid and N-acetyl cysteine decrease mitochondrial-related oxidative stress in Alzheimer disease patient fibroblasts. *J Alzheimers Dis.* 2007 Sep;12(2):195-206.
14. Hagen TM, Ingersoll RT, Lykkesfeldt J, et al. (R)-alpha-lipoic acid-supplemented old rats have improved mitochondrial function, decreased oxidative damage, and increased metabolic rate. *FASEB J.* 1999 Feb;13(2):411-8.
15. Lanza IR, Sreekumaran Nair K. Regulation of skeletal muscle mitochondrial function: genes to proteins. *Acta Physiol (Oxf).* 2010 Aug;199(4):529-47.
16. Spindler SR. Caloric restriction: from soup to nuts. *Ageing Res Rev.* 2010 Jul;9(3):324-53.
17. Suwa M, Egashira T, Nakano H, Sasaki H, Kumagai S. Metformin increases the PGC-1alpha protein and oxidative enzyme activities possibly via AMPK phosphorylation in skeletal muscle in vivo. *J Appl Physiol.* 2006 Dec;101(6):1685-92.
18. Chowanadisai W, Bauerly KA, Tchaparian E, Wong A, Cortopassi GA, Rucker RB. Pyrroloquinoline quinone stimulates mitochondrial biogenesis through cAMP response element-binding protein phosphorylation and increased PGC-1alpha expression. *J Biol Chem.* 2010 Jan 1;285(1):142-52.
19. de Moura MB, dos Santos LS, Van Houten B. Mitochondrial dysfunction in neurodegenerative diseases and cancer. *Environ Mol Mutagen.* 2010 Jun;51(5):391-405.
20. Blass JP. The mitochondrial spiral. An adequate cause of dementia in the Alzheimer's syndrome. *Ann N Y Acad Sci.* 2000; 924:170-83.
21. Chen JX, Yan SD. Amyloid-beta-induced mitochondrial dysfunction. *J Alzheimers Dis.* 2007 Sep; 12(2):177-84.
22. Lustbader JW, Cirilli M, Lin C, et al. ABAD directly links Abeta to mitochondrial toxicity in Alzheimer's disease. *Science.* 2004 Apr 16; 304(5669):448-52.
23. Wang X, Su B, Lee HG, et al. Impaired balance of mitochondrial fission and fusion in Alzheimer's disease. *J Neurosci.* 2009 Jul 15; 29(28):9090-103.
24. Lin TK, Liou CW, Chen SD, et al. Mitochondrial dysfunction and biogenesis in the pathogenesis of Parkinson's disease. *Chang Gung Med J.* 2009 Nov-Dec;32(6):589-99.
25. Abou-Sleiman PM, Muqit MM, Wood NW. Expanding insights of mitochondrial dysfunction in Parkinson's disease. *Nat Rev Neurosci.* 2006 Mar; 7(3):207-19.
26. Schapira AH, Bezard E, Brotchie J, et al. Novel pharmacological targets for the treatment of Parkinson's disease. *Nat Rev Drug Discov.* 2006;5:845-54.
27. Reddy PH, Mao P, Manczak M. Mitochondrial structural and functional dynamics in Huntington's disease. *Brain Res Rev.* 2009 Jun; 61(1):33-48.
28. Pandey M, Varghese M, Sindhu KM, et al. Mitochondrial NAD+-linked State 3 respiration and complex-I activity are compromised in the cerebral cortex of 3-nitropropionic acid-induced rat model of Huntington's disease. *J Neurochem.* 2008 Jan; 104(2):420-34.
29. Panov AV, Gutekunst CA, Leavitt BR, et al. Early mitochondrial calcium defects in Huntington's disease are a direct effect of polyglutamines. *Nat Neurosci.* 2002 Aug; 5(8):731-6.
30. Muller WE, Eckert A, Kurz C, Eckert GP, Leuner K. Mitochondrial dysfunction: common final pathway in brain aging and Alzheimer's disease--therapeutic aspects. *Mol Neurobiol.* 2010 Jun;41(2-3):159-71.
31. Schleicher M, Shepherd BR, Suarez Y, et al. Prohibitin-1 maintains the angiogenic capacity of endothelial cells by regulating mitochondrial function and senescence. *J Cell Biol.* 2008 Jan 14;180(1):101-12.
32. Oesenburg H, Iusuf D, van der Harst P, van Gilst WH, Henning RH, Roks AJ. Bradykinin protects against oxidative stress-induced endothelial cell senescence. *Hypertension.* 2009 Feb;53(2):417-22.
33. Yang Z, Harrison CM, Chuang GC, Ballinger SW. The role of tobacco smoke induced mitochondrial damage in vascular dysfunction and atherosclerosis. *Mutat Res.* 2007 Aug 1;621(1-2):61-74.
34. Knight-Lozano CA, Young CG, Burow DL, et al. Cigarette smoke exposure and hypercholesterolemia increase mitochondrial damage in cardiovascular tissues. *Circulation.* 2002 Feb 19;105(7):849-54.
35. Jia L, Liu Z, Sun L, et al. Acrolein, a toxicant in cigarette smoke, causes oxidative damage and mitochondrial dysfunction in RPE cells: protection by (R)-alpha-lipoic acid. *Invest Ophthalmol Vis Sci.* 2007 Jan; 48(1):339-48.
36. Yang Z, Knight CA, Mamerow M, et al. Prenatal environmental tobacco smoke exposure promotes adult atherogenesis and mitochondrial damage in apoE-/- mice fed a chow diet. *Circulation.* 2004 Dec 14; 110(24):3715-20.
37. Bach D, Pich S, Soriano FX, et al. Mitofusin-2 determines mitochondrial network architecture and mitochondrial metabolism. A novel regulatory mechanism altered in obesity. *J Biol Chem.* 2003 May 9; 278(19):17190-7.
38. Li M, Absher M, Liang P, Russell JC, Sobel BE, Fukagawa NK. High glucose concentrations induce oxidative damage to mitochondrial DNA in explanted vascular smooth muscle cells. *Exp Biol Med.* 2001; 226:450-7.
39. Vanhorebeek I, Ellger B, De Vos R, et al. Tissue-specific glucose toxicity induces mitochondrial damage in a burn injury model of critical illness. *Crit Care Med.* 2009 Apr;37(4):1355-64.
40. Madamanchi NR, Runge MS. Mitochondrial dysfunction in atherosclerosis. *Circ Res.* 2007 Mar 2;100(4):460-73.
41. Graier WF, Malli R, Kostner GM. Mitochondrial protein phosphorylation: instigator or target of lipotoxicity? *Trends Endocrinol Metab.* 2009 May;20(4): 186-93.
42. Maassen JA. Mitochondria, body fat and type 2 diabetes: what is the connection? *Minerva Med.* 2008 Jun;99(3):241-51.
43. Karamanlidis G, Nascimbeni L, Couper GS, Shekar PS, del Monte F, Tian R. Defective DNA replication impairs mitochondrial biogenesis in human failing hearts. *Circ Res.* 2010 May 14;106(9):1541-8.
44. Mortensen SA, Vadhanavikit S, Muratsu K, Folkers K. Coenzyme Q10: clinical benefits with biochemical correlates suggesting a scientific breakthrough in the management of chronic heart failure. *Int J Tissue React.* 1990;12(3):155-62.
45. Langsjoen PH, Langsjoen AM. Supplemental ubiquinol in patients with advanced congestive heart failure. *Biofactors.* 2008;32(1-4):119-28.
46. Serati AR, Motamedi MR, Emami S, Varedi P, Movahed MR. L-carnitine treatment in patients with mild diastolic heart failure is associated with improvement in diastolic function and symptoms. *Cardiology.* 2010;116(3):178-82.
47. Ladiges W, Wanagat J, Preston B, Loeb L, Rabinovitch P. A mitochondrial view of aging, reactive oxygen species and metastatic cancer. *Aging Cell.* 2010 Aug;9(4):462-5.
48. Yu JJ, Yan T, Jiang YC. Mitochondrial function score combined with Gleason score for predicting the progression of prostate cancer. *Zhonghua Nan Ke Xue.* 2010 Mar;16(3):220-2.
49. Ma Y, Bai RK, Trieu R, Wong LJ. Mitochondrial dysfunction in human breast cancer cells and their transmtochondrial cybrids. *Biochim Biophys Acta.* 2010 Jan; 1797(1):29-37.
50. Ordys BB, Launay S, Deighton RF, McCulloch J, Whittle IR. The role of mitochondria in glioma pathophysiology. *Mol Neurobiol.* 2010 Aug;42(1):64-75.
51. Lee HC, Chang CM, Chi CW. Somatic mutations of mitochondrial DNA in aging and cancer progression. *Ageing Res Rev.* 2010 Nov; 9 Suppl 1:S47-58.

AS WE SEE IT

52. Ralph SJ, Rodriguez-Enriquez S, Neuzil J, Saavedra E, Moreno-Sanchez R. The causes of cancer revisited: "mitochondrial malignancy" and ROS-induced oncogenic transformation - why mitochondria are targets for cancer therapy. *Mol Aspects Med.* 2010 Apr;31(2):145-70.
53. Kulawiec M, Owens KM, Singh KK. Cancer cell mitochondria confer apoptosis resistance and promote metastasis. *Cancer Biol Ther.* 2009 Jul;8(14):1378-85.
54. Ishikawa K, Takenaga K, Akimoto M, et al. ROS-generating mitochondrial DNA mutations can regulate tumor cell metastasis. *Science.* 2008 May 2; 320(5876):661-4.
55. Hung WY, Wu CW, Yin PH, et al. Somatic mutations in mitochondrial genome and their potential roles in the progression of human gastric cancer. *Biochim Biophys Acta.* 2010 Mar;1800(3):264-70.
56. Wallace DC, Shoffner JM, Trounce I, et al. Mitochondrial DNA mutations in human degenerative diseases and aging. *Biochim Biophys Acta.* 1995 May 24; 1271(1):141-51.
57. Shidara Y, Yamagata K, Kanamori T, et al. Positive contribution of pathogenic mutations in the mitochondrial genome to the promotion of cancer by prevention from apoptosis. *Cancer Res.* 2005 Mar 1;65(5):1655-63.
58. Newmeyer DD, Ferguson-Miller S. Mitochondria: releasing power for life and unleashing the machineries of death. *Cell.* 2003 Feb 21;112(4):481-90.
59. Ricci JE, Munoz-Pinedo C, Fitzgerald P, et al. Disruption of mitochondrial function during apoptosis is mediated by caspase cleavage of the p75 subunit of complex I of the electron transport chain. *Cell.* 2004 Jun 11;117(6):773-86.
60. Karbowski M, Youle RJ. Dynamics of mitochondrial morphology in healthy cells and during apoptosis. *Cell Death Differ.* 2003 Aug;10(8):870-80.
61. Singh KK. Mitochondrial dysfunction is a common phenotype in aging and cancer. *Ann N Y Acad Sci.* 2004 Jun;1019:260-4.
62. Nicolson GL, Conklin KA. Reversing mitochondrial dysfunction, fatigue and the adverse effects of chemotherapy of metastatic disease by molecular replacement therapy. *Clin Exp Metastasis.* 2008; 25(2):161-9.
63. Atamna H, Robinson C, Ingersoll R, Elliott H, Ames BN. N-t-Butyl hydroxylamine is an antioxidant that reverses age-related changes in mitochondria in vivo and in vitro. *FASEB J.* 2001 Oct;15(12):2196-204.
64. Hagen TM, Wehr CM, Ames BN. Mitochondrial decay in aging. Reversal through supplementation of acetyl-L-carnitine and N-tert-butyl-alpha-phenyl-nitro. *Ann N Y Acad Sci.* 1998 Nov 20;854:214-23.
65. Smith RA, Adlam VJ, Blaikie FH, et al. Mitochondria-targeted antioxidants in the treatment of disease. *Ann N Y Acad Sci.* 2008 Dec;1147:105-11.
66. Murphy MP, Smith RA. Targeting antioxidants to mitochondria by conjugation to lipophilic cations. *Annu Rev Pharmacol Toxicol.* 2007; 47:629-56.
67. Manczak M, Mao P, Calkins MJ, et al. Mitochondria-targeted antioxidants protect against amyloid-beta toxicity in Alzheimer's disease neurons. *J Alzheimers Dis.* 2010; 20 Suppl 2:S609-31.
68. Liu J, Atamna H, Kuratsune H, Ames BN. Delaying brain mitochondrial decay and aging with mitochondrial antioxidants and metabolites. *Ann N Y Acad Sci.* 2002 Apr;959:133-66.
69. Bagh MB, Thakurta IG, Biswas M, Behera P, Chakrabarti S. Age-related oxidative decline of mitochondrial functions in rat brain is prevented by long term oral antioxidant supplementation. *Biogerontology.* 2010 Sep 21.
70. Gottlieb E, Tomlinson IP. Mitochondrial tumour suppressors: a genetic and biochemical update. *Nat Rev Cancer.* 2005 Nov;5(11):857-66.
71. Pratheeshkumar P, Thejass P, Kutan G. Diallyl disulfide induces caspase-dependent apoptosis via mitochondria-mediated intrinsic pathway in B16F-10 melanoma cells by up-regulating p53, caspase-3 and down-regulating pro-inflammatory cytokines and nuclear factor- κ B-1 activation. *J Environ Pathol Toxicol Oncol.* 2010; 29(2):113-25.
72. Ip SW, Lan SH, Huang AC, et al. Capsaicin induces apoptosis in SCC-4 human tongue cancer cells through mitochondria-dependent and -independent pathways. *Environ Toxicol.* 2010 Oct 5.
73. Morino K, Petersen KF, Dufour S, et al. Reduced mitochondrial density and increased IRS-1 serine phosphorylation in muscle of insulin-resistant offspring of type 2 diabetic parents. *J Clin Invest.* 2005 Dec;115(12):3587-93.
74. Chen Y, Zhou K, Wang R, et al. Antidiabetic drug metformin (GlucophageR) increases biogenesis of Alzheimer's amyloid peptides via up-regulating BACE1 transcription. *Proc Natl Acad Sci U S A.* 2009 Mar 10;106(10):3907-12.
75. Skov V, Glintborg D, Knudsen S, et al. Pioglitazone enhances mitochondrial biogenesis and ribosomal protein biosynthesis in skeletal muscle in polycystic ovary syndrome. *PLoS One.* 2008 Jun 18;3(6):e2466.
76. Bogacka I, Xie H, Bray GA, Smith SR. Pioglitazone induces mitochondrial biogenesis in human subcutaneous adipose tissue in vivo. *Diabetes.* 2005 May;54(5):1392-9.
77. Sahin E, Depinho RA. Linking functional decline of telomeres, mitochondria and stem cells during ageing. *Nature.* 2010 Mar 25;464(7288):520-8.
78. Conboy IM, Rando TA. Aging, stem cells and tissue regeneration: lessons from muscle. *Cell Cycle.* 2005 Mar;4(3):407-10.
79. Alikhani Z, Alikhani M, Boyd CM, Nagao K, Trackman PC, Graves DT. Advanced glycation end products enhance expression of pro-apoptotic genes and stimulate fibroblast apoptosis through cytoplasmic and mitochondrial pathways. *J Biol Chem.* 2005 Apr 1;280(13):12087-95.
80. Kil IS, Lee JH, Shin AH, Park JW. Glycation-induced inactivation of NADP(+)-dependent isocitrate dehydrogenase: implications for diabetes and aging. *Free Radic Biol Med.* 2004 Dec 1;37(11): 1765-78.
81. Hipkiss AR. Mitochondrial dysfunction, proteotoxicity, and aging: causes or effects, and the possible impact of NAD+-controlled protein glycation. *Adv Clin Chem.* 2010; 50:123-50.
82. Short KR, Bigelow ML, Kahl J, et al. Decline in skeletal muscle mitochondrial function with aging in humans. *Proc Natl Acad Sci U S A.* 2005 Apr 12;102(15): 5618-23.
83. Linnane AW, Kovalenko S, Gingold EB. The universality of bioenergetic disease: age-associated cellular bioenergetic degradation and amelioration therapy. *Ann N Y Acad Sci.* 1998 Nov 20;854:202-13.
84. Hipkiss AR. Aging, proteotoxicity, mitochondria, glycation, NAD and carnosine: possible inter-relationships and resolution of the oxygen paradox. *Front Aging Neurosci.* 2010 Mar 18;2:10.
85. Hosoe K, Kitano M, Kishida H, et al. Study on safety and bioavailability of ubiquinol (Kaneka QH) after single and 4-week multiple oral administration to healthy volunteers. *Regul Toxicol Pharmacol.* 2007 Feb;47(1):19-28.





ENHANCE Heart Health

The reason for many circulatory problems is the breakdown of endothelial function and structure.

Today, there are nutrients that have been clinically shown to help maintain healthy endothelial function and arterial circulation. **Endothelial Defense™ with GliSODin®** provides potent nutrients to support endothelial health: **standardized pomegranate** and an orally active form of **superoxide dismutase**.

While both of these components have been clinically shown to help with blood flow and age-related changes in endothelial function, Life Extension® has made the best endothelial product on the market even more powerful by adding **Full-Spectrum Pomegranate**.¹⁻⁷

The daily serving of 2 softgels of Endothelial Defense™ contains:

Superoxide Dismutase/Gliadin Complex (GliSODin®) [SOD (Superoxide Dismutase) Enzyme Activity = 500 IU]	500 mg
POMELLA® Pomegranate (<i>Punica granatum</i>) Extract (fruit) [std. to 30% punicalagins (120 mg)]	400 mg
Pomegranate (<i>Punica granatum</i>) 5:1 Extract (fruit)	100 mg
PomComplete™ Pomegranate (<i>Punica granatum</i>) Blend [flower extract and seed oil (standardized to 22% (30 mg) punicic acid)]	137.5 mg

POMELLA® Extract is covered under U.S. Patent 7,638,640. POMELLA® Extract is a registered trademark of Verdure Sciences, Inc. Isocell SA, France is the owner of US Patents Nos. 6,045,809 and 6,426,068B1 and trademark of GliSODin®.

Contains soybeans and wheat. Contains gluten.

Next-Generation Pomegranate Power

The unique blend of **pomegranate flower extract** and **seed oil** in **Endothelial Defense** contains potent polyphenols that provide support for youthful **lipid** and **glucose metabolism**, natural **immunity**, and help with **inflammatory factors**.⁸

A bottle containing 60 softgels of **Endothelial Defense™ with Full-Spectrum Pomegranate™** retails for \$56. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$35.10** per bottle.



Item #01498

To Order **Endothelial Defense™ with Full-Spectrum Pomegranate™**,
call **1-800-544-4440** or
visit **www.LifeExtension.com**

References

1. Clin Nutr. 2004 Jun;23(3):423-33.
2. Am J Cardiol. 2005 Sep 15;96(6):810-4.
3. Heart. 2006 Jan;92(1):119-20.
4. Phytother Res. 2004 Dec;18(12):957-62.
5. Intensive Care Med. 2007 Apr; 33(4):694-702.
6. Allerg Immunol (Paris). 2007 Feb;39(2):45-50.
7. Free Radic Res. 2004 Sep;38(9):927-32.
8. Altern Med Rev. 2008 Jun;13(2):128-44.

Rock Solid **BONES**

Feeble bones severely hamper quality of life and put aging humans at risk for injury due to possible breaks or fractures. While most **Life Extension®** members take certain supplements to address this issue, we have combined critical **bone boosting** nutrients into one superior calcium formula called **Bone Restore**.

Bone Restore contains a broad spectrum of nourishment to support bone health. The formula includes highly absorbable forms of *bone fortifying calcium*, and a potent, *bioavailable form* of boron, along with **vitamin D3**, **magnesium**, **zinc**, **manganese**, and **silicon**.

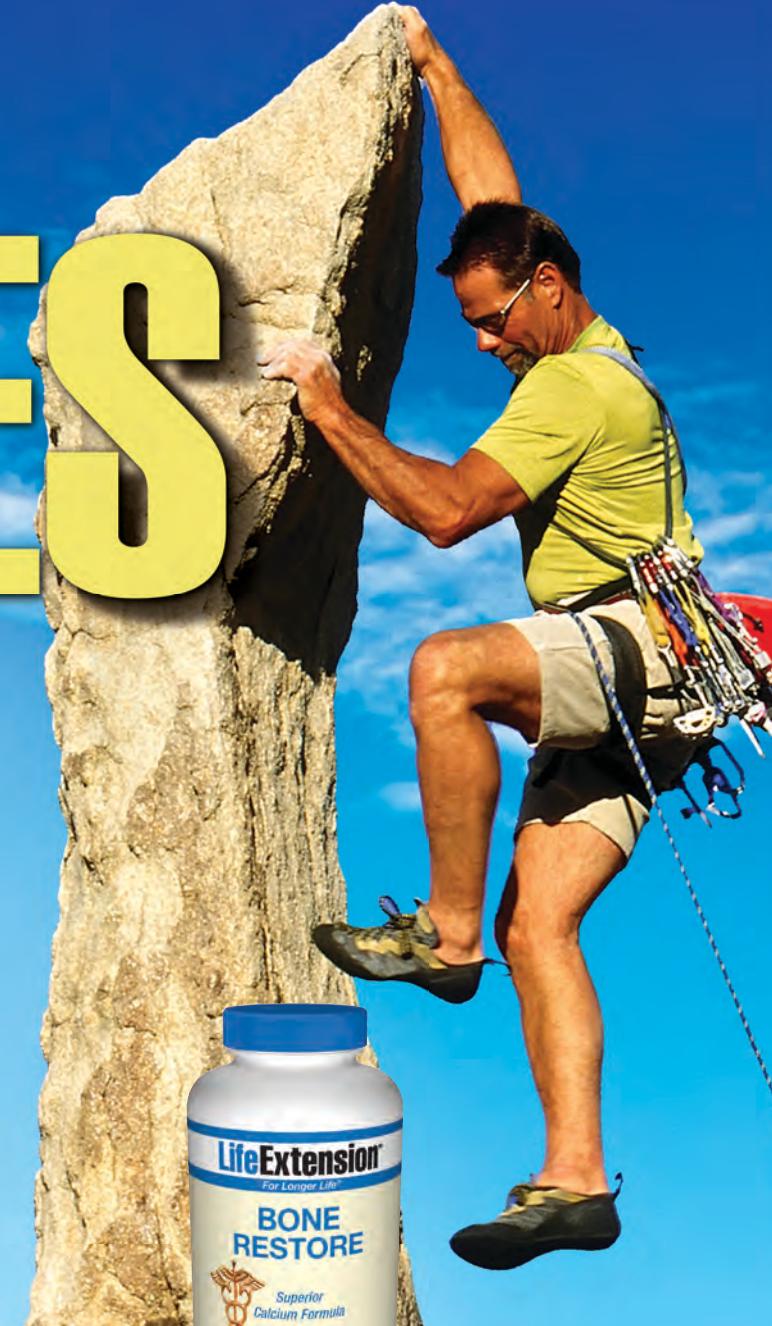
Bone Restore comes in fast-release capsules, making the minerals and other nutrients immediately available for absorption.

The retail price for 150 capsules of **Bone Restore** is \$22.50. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$13.16** per bottle.

To order **Bone Restore**,
call 1-800-544-4440 or
visit www.LifeExtension.com

Contains corn.

FruiteX B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc., U.S. Patent No. 5,962,049.



Item #00811

Just five capsules of **Bone Restore** provide:

Highly-Absorbable Calcium (from dicalcium malate, bis-glycinate, and fructoborate)	1,200 mg
Vitamin D3	1,000 IU
Magnesium	340 mg
Boron (calcium fructoborate as patented FruiteX B® OsteoBoron®)	3 mg
Zinc	2 mg
Manganese	1 mg
Silicon	5 mg

Mitochondrial Basics

with BioPQQ™

Energy to burn. It's more than just a phrase. It's the key to a healthy life span.

Behind every process your body needs to survive and thrive are the cellular energy generators known as **mitochondria**. Their function is so crucial that a growing number of scientists now believe mitochondrial longevity may determine *overall* longevity in aging humans.¹⁻⁵ That's why **Life Extension®** has remained at the forefront in identifying innovative compounds that specifically support mitochondrial health.

In addition to the more comprehensive **Mitochondrial Energy Optimizer with BioPQQ™** and standalone **PQQ** products, we now offer a one capsule per day formula for individuals seeking a simplified, low-cost option called **Mitochondrial Basics with BioPQQ™**.

The reason? We want all members to have access to targeted nutrients required to support mitochondrial function and the generation of healthy new mitochondria.

Three Premium Compounds in One Low-Cost Formula

The new **Mitochondrial Basics** brings together cutting-edge mitochondrial energizers, including the most exciting nutrient to emerge in recent years called *pyrroloquinoline quinone* or **PQQ**. The three ingredients in value-priced **Mitochondrial Basics** are:

1. PQQ. This breakthrough micronutrient has recently been shown to trigger **mitochondrial biogenesis**—the growth of new mitochondria in aging cells!⁶ PQQ also activates *genes* involved in protecting the delicate structures within the mitochondria.⁷⁻¹⁰

2. R-lipoic acid. The detrimental effects of free radicals comprise one of the chief obstacles to optimal mitochondrial energy production. Published studies confirm R-lipoic acid's power to promote mitochondrial bioenergetics while simultaneously *blunting* free radical activity.¹¹⁻¹⁶ **Mitochondrial Basics** contains the superior **Bio-Enhanced® R-lipoic acid** and is in a proprietary *microencapsulated* form for better absorption.

3. Acetyl-L-carnitine arginate. Fats are shuttled into the mitochondria for metabolic combustion by the amino acid **carnitine**. The *acetylated* form of carnitine helps to facilitate more efficient utilization of fats than carnitine alone.

Life Extension® members continue to enjoy access to a full range of targeted supplements clinically shown to optimize energy production in the mitochondria. Just one capsule a day of **Mitochondrial Basics** supplies:

BioPQQ™ 10 mg
R-lipoic acid 100 mg
Acetyl-L-carnitine 250 mg
arginate dihydrochloride



Item # 01569

A bottle containing 30 capsules of **Mitochondrial Basics with BioPQQ™** retails for \$52. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$31.05** per bottle.

PQQ can also be obtained as a low-cost standalone or in the **Mitochondrial Energy Optimizer** formula, both that will be described later in this issue.

**To order new
Mitochondrial Basics
with BioPQQ™
call 1-800-544-4440 or visit
www.LifeExtension.com**

BioPQQ™ is a trademark of MGC (Japan). Bio-Enhanced® is a registered trademark of Geronova Research, Inc. ArginoCarn® is a registered trademark of Sigma-tau Health Sciences, Inc. and is protected by US patents 6,365,622, US 6,703,042, and EP 1202956.

References

- 1. *Biochimie*. 1999 Dec;81(12):1131-2.
- 2. *Lancet*. 1989 Mar 25;1(8639):642-5.
- 3. *Curr Opin Clin Nutr Metab Care*. 2010 Jul 7.
- 4. *Age (Dordr)*. 2010 Mar 20.
- 5. *Ageing Res Rev*. 2010 Jun 25.
- 6. *J Biol Chem*. 2010 Jan 1;285:142-152.
- 7. *Alt Med Rev*. 2009; 14(3):268-77.
- 8. Entrez Gene: PARGC1A peroxisome proliferator-activated receptor gamma, coactivator 1 alpha [Homo sapiens] GenelID: 10891.
- 9. Entrez Gene: CREBBP CREB binding protein [Homo sapiens] GenelID: 1387.
- 10. *Hum Mol Genet*. 2008 Nov 1;17(21):3357-67.
- 11. *Biochem Biophys Res Commun*. 1996 Apr 16;221(2):422-9.
- 12. *FASEB J*. 1999 Feb;13(2):411-8.
- 13. *Antioxid Redox Signal*. 2000 Fall;2(3):473-83.
- 14. *Biochem Mol Biol Int*. 1995 Oct;37(2):361-70.
- 15. *Arch Biochem Biophys*. 2004 Mar 1;423(1):126-35.
- 16. *Redox Rep*. 2005;10(1):52-60.

Contains soybeans and rice.



IN THE NEWS

Magnesium Protects Women Against Sudden Cardiac Death

Greater dietary intake of magnesium and higher plasma magnesium levels are associated with a reduced risk of sudden cardiac death in women, according to a study published in the *American Journal of Clinical Nutrition*.^{*} Long known for its anti-arrhythmic properties in cellular and experimental models, magnesium's relation to sudden cardiac death has been unclear.



Scientists examined dietary intake data collected from more than 88,000 women enrolled in the Nurses' Health Study. During 26 years of follow-up, 505 cases of sudden cardiac death occurred. In a case-control analysis, the scientists compared plasma magnesium levels between 99 sudden cardiac death cases and 291 control patients.

Higher dietary intake of magnesium and higher plasma magnesium levels were associated with lower risks of sudden cardiac death.

These findings suggest that increasing magnesium intake and plasma levels may protect women against sudden cardiac death by preventing abnormal heart rhythms.

—E. Wagner, ND

* *Am J Clin Nutr.* 2010 Nov 24.

Higher Vitamin D Levels Associated with Lower Risk of Bladder Cancer

An article published in the journal *Cancer Research* reveals an association between higher levels of serum vitamin D and a lower risk of bladder cancer in men.*

The study involved 500 participants in the Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study of Finnish male smokers conducted to determine the effects of alpha-tocopherol and beta-carotene supplementation on cancer risk.

The researchers compared 250 subjects who were diagnosed with bladder cancer through April 2005 with an equal number of participants who did not have the disease. Men whose vitamin D level was less than 25 nanomoles per liter experienced a 73% greater adjusted risk of the disease than those whose levels were at least 50 nanomoles per liter.

"These findings are consistent with previous cell culture, *in vivo*, and genetic evidence suggesting that greater exposure to vitamin D could have a role in protecting against bladder cancer," Alison M. Mondul and coauthors write.

Editor's note: The finding adds another cancer to the list of those for which vitamin D appears to have a protective benefit.

—D. Dye

* <http://cancerres.aacrjournals.org/content/early/2010/10/21/0008-5472.CAN-10-0985.abstract>. Accessed November 17, 2010.

IN THE NEWS

Olive Oil Protects Liver from Oxidative Stress

Researchers writing in Bio-Med Central's open access journal *Nutrition and Metabolism* discovered that when rats were exposed to a moderately toxic herbicide, ingestion of olive oil partially protected them against liver damage.* The herbicide is known to deplete antioxidants and cause oxidative stress.

The experiments were carried out on a group of 80 rats by Mohamed Hammami and his teams from the University of Monastir, Tunisia, and King Saud University, Riyadh, Saudi Arabia. The researchers divided the rats into a control group, an olive oil group, and 6 groups that were exposed to the herbicide '2,4-Dichlorophenoxyacetic acid' with or without either whole olive oil, or one of two oil extracts—the hydrophilic fraction or the lipophilic fraction.

The results were interesting. Every rat given the herbicide showed signs of significant liver damage, but the rats that ingested extra virgin olive oil and hydrophilic fraction showed a significant increase in antioxidant enzyme activity and a decrease in markers of liver damage.

—J. Finkel

* <http://www.nutritionandmetabolism.com/content/7/1/80>. Accessed November 15, 2010.



Leukemia Patients with Insufficient Vitamin D Levels Face Earlier Mortality Risk

A report published in the journal *Blood* reveals an increased risk of rapid disease progression and earlier mortality in chronic lymphocytic leukemia (CLL) patients who had insufficient vitamin D levels.*

Tait Shanafelt, MD, and his colleagues evaluated the blood of 390 newly diagnosed chronic lymphocytic leukemia patients for plasma 25-hydroxyvitamin D. After a median follow-up of three years, an association was observed between decreasing vitamin D levels and shorter intervals between diagnosis and cancer progression, as well as reduced survival. Participants whose vitamin D levels were insufficient had a 66% greater risk of disease progression necessitating chemotherapy and more than double the risk of dying than those with sufficient levels.

"Vitamin D insufficiency is associated with inferior time to treatment and overall survival in CLL patients," the authors conclude. "Whether normalizing vitamin D levels in deficient CLL patients would improve outcome merits clinical testing."

Editor's note: "It is simple for patients to have their vitamin D levels checked by their physicians with a blood test," Dr. Shanafelt remarked. "And if they are deficient, vitamin D supplements are widely available and have minimal side effects."

—D. Dye

* *Blood*. 2010 Nov 3.



Kidney-Cooling Device Could Save Lives

A recent article in the *San Antonio Business Journal* describes a device being developed by a team of researchers in San Antonio that utilizes cutting-edge technology to cool the kidney to aid in surgery.* The device is being developed by South Texas Technology Management, which is in charge of taking the medical inventions developed at the University of Texas Health and Science Center at San Antonio and commercializing them.

Between 20,000 and 30,000 partial nephrectomy (kidney) surgeries are performed a year in the United States. A typical nephrectomy with a cancerous growth involves clamping off blood flow to the organ, which gives surgeons roughly 15 minutes to perform the operation before kidney failure is likely. Because of this enormous time constraint, many doctors will choose to simply remove the kidney instead.

The new device may double the amount of time a surgeon has to work with. The device cools the kidney by laposcopically inserting tubes that wrap around the kidney and pump cold fluid to lower the temperature of the organ.

"We think this device will encourage more doctors to offer this type of surgery rather than removing the entire kidney," Dr. Dipen Parekh, a surgeon and associate professor of urology at the Health Science Center, says.

—J. Finkel

* <http://www.bizjournals.com/sanantonio/print-edition/2010/10/29/researchers-expect-kidney-cooling.html>. Accessed November 15, 2010.



IN THE NEWS

Greater Flavonoid Intake Linked with Lower Cancer Risk

In a study reported in a recent issue of *Nutrition and Cancer*, researchers in Milan uncovered an association between a lower risk of several types of cancer and an increased intake of flavonoids and proanthocyanidins.*

Carlo La Vecchia of the Università degli Studi di Milano and colleagues evaluated data in a network of case-control studies conducted at multiple Italian centers since the early 1990s. The studies included a total of 9,622 cases of cancer and 16,050 controls. The participants' diets were analyzed for 6 classes of flavonoids, including isoflavones, anthocyanidins, flavanols, flavanones, flavones and flavonols, and 6 classes of proanthocyanidins.

"The findings from this large network of Italian case-control studies have provided support for an apparent protective role of flavanones on upper aerodigestive tract cancers; flavonols, anthocyanidins, and proanthocyanidins on colorectal cancer; flavonols and flavones on breast cancer; isoflavones on ovarian cancer; and flavonols on renal cancer," the authors conclude.

Editor's note: These polyphenolic compounds are found in fruit, vegetables, and plant-sourced beverages, and may be responsible for the protective effects observed for plant foods against a number of chronic diseases.

—D. Dye

* *Nutr Cancer*. 2010 Aug; 62(7):871-7.

Cardiac Fat Oxidation Aided by Olive Oil Compounds

A team of researchers from São Paulo State University, Brazil, recently published a study in *Nutrition Journal* that tested the effectiveness of olive oil and its minor constituents as important dietary therapeutic interventions in preventive medicine in regards to obesity-induced cardiac metabolic changes.*

The study involved two groups of rats receiving hypercaloric-chow. Halfway through the study, each group was divided into subgroups, with one group receiving standard food and saline, another group receiving standard food and olive oil, a third group receiving standard food and oleuropein, a fourth group receiving standard food and caffeic acid, and several more groups involving rats receiving some combination of hypercaloric food, olive oil, oleuropein, and caffeic acid.

The results were conclusive, as the study demonstrated for the first time that olive-oil, oleuropein, and caffeic-acid enhanced fat-oxidation and optimized cardiac energy metabolism in obesity conditions. Olive oil and its phenolic compounds improved myocardial oxidative stress in standard-fed conditions.

—J. Finkel

* *Nutr J*. 2010 Oct 19;9:46.



Curcumin Could Prevent Liver Damage

A new study performed at Saint Louis University suggests that curcumin may have some promise in preventing or treating liver damage from an advanced form of a condition known as fatty liver disease.* Curcumin is contained in the plant turmeric, which has been used by the Chinese for thousands of years and is the chemical that gives curry its spicy nature.

The research specifically points to curcumin's use as a potential weapon in the battle against a type of fatty liver disease called non-alcoholic steatohepatitis (NASH). NASH is commonly linked to obesity and weight gain.



"While research in an animal model and human clinical trials are needed, our study suggests that curcumin may be an effective therapy to treat and prevent liver fibrosis, which is associated with NASH," said Anping Chen, PhD, director of research in the pathology department of Saint Louis University.

—J. Finkel

* <http://www.sciencedaily.com/releases/2010/10/101029152755.htm>. Accessed November 15, 2010.

IN THE NEWS



Cinnamon Extracts Could Help Reduce Diabetes and Heart Disease Risk Factors

According to new studies led by US Department of Agriculture (USDA) chemist Richard Anderson, a water-soluble extract of cinnamon could help reduce risk factors long associated with diabetes and heart disease.* Cinnamon extract has antioxidant compounds, which may be what is responsible for this data.

The study involved twenty-two obese participants with impaired glucose values, or "prediabetes." Prediabetes occurs when cells show resistance to the higher-than-normal levels of insulin produced by the pancreas. The members of the study were divided into two random groups and either given a placebo or 250 milligrams of dried, water-soluble cinnamon extract twice daily with their diets. The results were measured through blood samples that were collected at the beginning of the study, after six weeks, and after 12 weeks. The study showed that water-soluble cinnamon extract improved several antioxidant variables by as much as 13% to 23%. These numbers led to decreases in fasting glucose.

—J. Finkel

* *J Am Coll Nutr.* 2009;28:16-21.

Fish Oils May Help Fight Diabetes

A recent study published in the *Journal of Nutritional Biochemistry* points to the use of fish oils as a weapon in the fight against diabetes.* Specifically, fish oils activate the transcription factor PPAR-gamma, which increases the regulation of adipocytes and helps to maintain glucose homeostasis.

The mice in the study that were fed the diabetes drug rosiglitazone, brand name Avandia®, had a significantly lower feed intake but showed no major effect on body weight or fat pad weight. The mice fed fish oil did not significantly decrease feed intake, but they did show significantly decreased body and fat pad weight.

These results suggest that there was increased glucose utilization and, therefore, a reduced blood glucose concentration in the transgenic mice. Also, the plasma adiponectin was elevated by fish oil treatment, suggesting a role of adiponectin in mediating the polyunsaturated fatty acids (PUFA) effect. These results suggest that PUFA may serve as a natural regulator of glucose uptake in vivo and these effects are mainly through PPAR-gamma function.

—J. Finkel

* *J Nutr Biochem.* 2010 Oct 20.

DHA Improves Stroke Recovery

An article in *Translational Stroke Research* reports a neuroprotective effect for DHA given after ischemic stroke.*

Dr. Nicolas Bazan and his associates induced stroke in rats by occluding the middle cerebral artery. In a preliminary experiment, the animals received DHA intravenously following cerebral artery occlusion. A second experiment involved the administration of DHA post-stroke and the assessment of brain damage by MRI. In a third experiment, rats were given DHA or saline after stroke onset, after which their brains were examined for NPD1, a substance for which DHA is a precursor that has cell-protective effects.

The first experiment found a reduction in neurologic deficits in rats that received DHA compared with controls, even when DHA was administered 5 hours after the onset of stroke. In the study involving MRI, DHA treatment was associated with smaller infarcts. The third experiment revealed increased NPD1 synthesis in the DHA treated group.

Editor's note: The findings identify a possible treatment for strokes and quantify the time limit of DHA's effectiveness.

—D. Dye

* *Trans Stroke Res.* 2010 Nov 4.



Clinical Study Enrollment for Alzheimer's Disease Patients



The Life Extension Foundation® is sponsoring a study to be conducted in South Florida. The objective is to measure the effects of weekly injections of a study medication plus nutritional supplements that may help suppress the inflammatory factor implicated in the neuronal degeneration of Alzheimer's disease.

Twenty million Americans alive today are destined to contract Alzheimer's disease, an affliction that robs us of memory, intelligence, and eventually our most rudimentary cognitive abilities. The few drugs approved to treat Alzheimer's symptoms produce only modest, short-term effects and some patients cannot tolerate them at all.

This study requires weekly visits and runs approximately 17 weeks. You will receive blood tests, evaluations, and blood pressure checks as well as study medication and supplements at no cost to you.

We are seeking adults between the ages of 60-85 who have a diagnosis of Alzheimer's disease.

SO HOW DO I LEARN MORE ABOUT THIS STUDY?

If you or a person you know with mild or moderate Alzheimer's disease desires to participate in this new clinical study, or would like to receive more information, please call **1-866-517-4536** or e-mail **LEClinicalResearch@LifeExtension.com** or you may pre-register at www.lef.org/ClinicalResearch.

All costs associated with this study are being funded by the Life Extension Foundation®. This study is enrolling now!

**Register now or call toll-free
1-866-517-4536 for more information.**

LifeExtension
FOUNDATION®

SUPER BOOSTER

with the most effective form of Vitamin K2,
Gamma Tocopherol, Ginkgo, and much more!

Despite abundant scientific validation, many people still do not take vital nutrients because they don't want to swallow so many pills. This problem has been solved with a one-per-day softgel that includes multiple health-promoting nutrients in just one supplement.

The Life Extension® Super Booster contains critical oil-based nutrients that cannot be incorporated into dry-powder based formulas like the Life Extension Mix™.

The Super Booster provides the most effective form of **vitamin K**, known as **menaquinone-7**, along with other forms of this critical nutrient.

Just one Super Booster softgel provides:

- **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.

- **Sesame Lignans** Sesame lignans augment the antioxidant effects of both alpha-and gamma-tocopherol. In a human study conducted at Life Extension, gamma tocopherol plus sesame lignans was 25% more effective in suppressing measurements of free-radical damage than gamma tocopherol and tocotrienols.

- **Vitamin K2** Vitamin K1 from dietary plant sources is poorly absorbed and only a small fraction gets into the bloodstream. **Vitamin K2** is absorbed much more efficiently.



Item #01380

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

Scientific studies show **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** to keep calcium in the bone and out of the arteries.

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

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

- **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.

- **Selenium** 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. Selenium's effects in boosting glutathione are well-established.

A bottle of 60 Super Booster softgels retails for \$42. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$25.65** 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.

Contains soybeans and sesame.

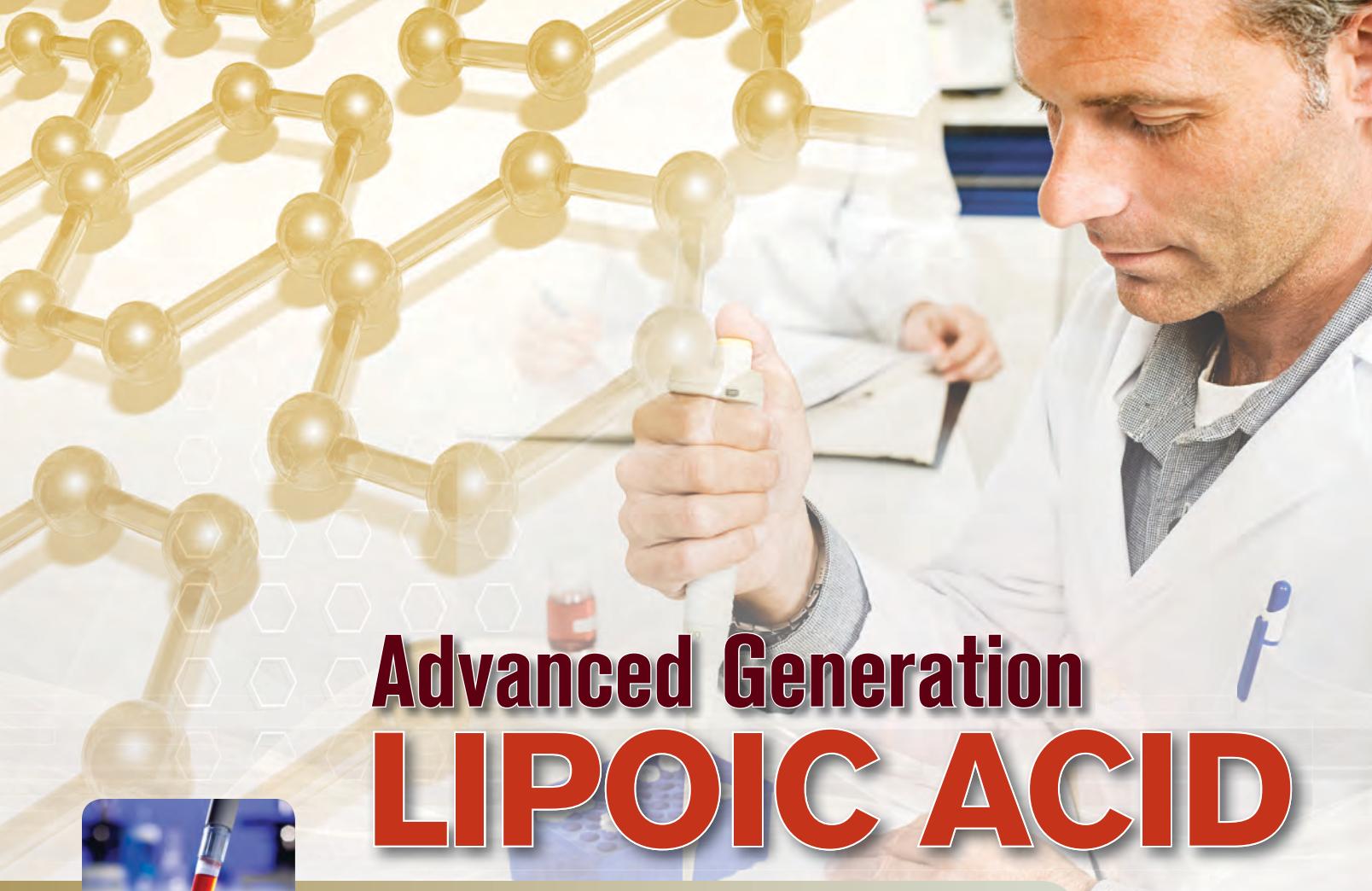
Caution: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Individuals with in-born errors of copper metabolism (e.g. Wilson's disease) should avoid daily, chronic use of this product.

Lyc-O-Mato® is a registered trademark of LycoRed Natural Products Limited.



Just one softgel of Super Booster supplies:

Gamma tocopherol	230 mg
Ginkgo extract	120 mg
Chlorophyllin	100 mg
Vitamin K2 (as menaquinone-7)	100 mcg
Vitamin K2 (as menaquinone-4)	1000 mcg
Vitamin K1 (as phytonadione)	1000 mcg
Sesame lignans	20 mg
Lycopene	10 mg
Lutein	2 mg
Selenium (as Se-Methyl L-Selenocysteine)	67 mcg
Selenium (as L-Selenomethionine)	67 mcg
Selenium (as Sodium selenite)	67 mcg
Vitamin B12	300 mcg
Vitamin C	90 mg
Ascorbyl palmitate	50 mg
Zinc	10 mg
Mixed tocopherols	359 mg



Advanced Generation **LIPOIC ACID**

More STABLE, POTENT, and FASTER-ACTING

Dedicated research and development has produced a form of **R-lipoic acid** that is being hailed as the “next-generation” antioxidant powerhouse.

Life Extension's **Super R-Lipoic Acid** has demonstrated superior bioavailability, stability, and potency for a variety of health benefits. This

breakthrough converts the biologically active “R” form of lipoic acid to sodium-R-lipoic acid, which in a recent human study achieved **10–30 times** higher peak blood levels than pure R-lipoic acid.¹

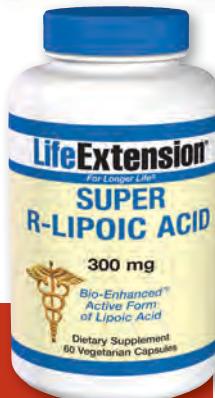
Not only does this lipoic acid formulation reach higher peak blood levels,² it also achieves them sooner, up to **12 times** faster than R-lipoic acid, ensuring rapid uptake from the plasma into the tissues.¹ A recent study showed that oral ingestion of **Super R-Lipoic Acid** reached peak plasma concentrations within just **10–20 minutes** of supplementation.²

What's more, unlike other forms of lipoic acid, **Super R-Lipoic Acid** is more stable in the body. The increased stability of this enhanced formulation is the reason for its greater absorption and bioavailability compared with R-lipoic acid.

POWERFUL ANTIOXIDANT PROTECTION

The superior antioxidant effects of R-lipoic acid are already well known for supporting healthy mitochondrial function. **Super R-Lipoic Acid** provides more potent benefits for preserving youthful cellular energy levels.

A bottle of **Super R-Lipoic Acid** containing 60 vegetarian capsules retails for \$49. If a member buys four bottles during **Super Sale**, the cost is only **\$30.38 per bottle**. Each capsule contains **300 mg** of stabilized, **Bio-Enhanced® Na-RALA sodium R-Lipoate** supplying **210 mg** of **R-lipoic acid**. Contains rice.



To order **Super R-Lipoic Acid**,
call 1-800-544-4440 or
visit www.LifeExtension.com

Item #01208

References:

- Carlson DA, Young KL, Fischer SJ, Ulrich H. In: Packer L., Patel M., eds. *Lipoic Acid: Energy Production, Antioxidant Activity and Health Effects*. London, Taylor & Francis Publishers; 2008:235-70.
- Carlson DA, Smith AR, Fischer SJ, Young KL, Packer L. *Altern Med Rev*. 2007 Dec;12(4):343-51.

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Top Off Your TESTOSTERONE *Naturally*

Low Testosterone Levels May Lead to:

Reduced Sex Drive • Depression

Less Energy • Cloudy Thinking

Weight Gain • Cardiovascular Issues

Maintaining healthy testosterone levels is one of the most important steps you can take to regain your health and improve your performance.

With research showing that by the time a man is 60 years old, he may produce 60% less testosterone than he did in his 20s, the time is now to add Life Extension's Super MiraForte with Standardized Lignans to your supplement regimen.

Each daily dose of Super MiraForte contains the following testosterone supporting ingredients:

1500 mg	Chrysin
15 mg	Bioperine®
850 mg	Muira puama
282 mg	Nettle root
50 mg	Ginger root
15 mg	Chelated elemental zinc
320 mg	Maca
33.4 mg	HMRlignan™ Norway Spruce lignan extract



Item # 01315

The retail price for a bottle of 120 capsules of **Super MiraForte with Standardized Lignans** is \$62. If a member buys four bottles during **Super Sale**, the price is reduced to \$37.80 per bottle.



**Super Health. Super Libido.
Super MiraForte.**

To order **Super MiraForte** call 1-800-544-4440 or visit www.LifeExtension.com

Contains corn. Bioperine® is a registered trademark of Sabinza Corp. HMRlignan™ is a registered trademark used under sublicense from Linnea S.A.

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.

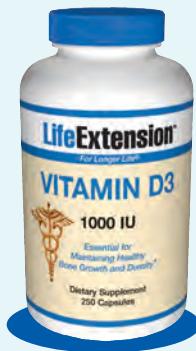
Which VITAMIN D is Right for You?



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.

Keep in mind that you may already be getting 1,000-3,000 IU of vitamin D in your multi-nutrient formula.



Vitamin D3 1,000 IU 250 capsules

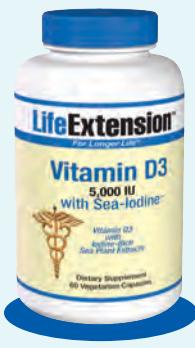
Retail: \$12.50

Super Sale Four-bottle
Member Price: **\$7.59**

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 with Sea-Iodine™* 60 vegetarian capsules

Retail: \$14

Super Sale Four-bottle
Member Price: **\$8.44**

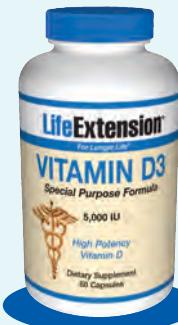
Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining 5,000 IU of **vitamin D3** and 1,000 mcg of **iodine** into one capsule makes taking these two nutrients economical and convenient.

Item # 01372

Please refer to website for allergen information.

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 medi-



Vitamin D3 5,000 IU 60 capsules

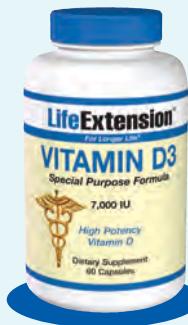
Retail: \$11

Super Sale Four-bottle
Member Price: **\$6.68**

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

Super Sale Four-bottle
Member Price: **\$8.51**

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 Liquid Emulsion 2,000 IU 1 ounce

Retail: \$28

Super Sale Four-bottle
Member Price: **\$16.88**

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

cal 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.



The Systemic Anti-Aging Effects of Ceramides

BY ROBERT HAAS, MS

Practically every major skin care company has invested massive amounts of research money in perfecting unique molecules called **ceramides** to help revive and hydrate aging skin.

In one recent groundbreaking study, 200 mg per day of orally ingested ceramides derived from wheat completely restored hydration in 95% of participants suffering from dry, flaky, itchy skin.¹

A growing number of published studies indicate that as we age, *ingestion* of ceramides could also provide **essential** protection against various age-related diseases.

In this article, you will discover how ceramides are not only an indispensable compound to fight skin aging but also how they act to combat **cancer**, **high cholesterol**, and **insulin resistance**. > >

Ceramides: Benefits Beyond Beauty

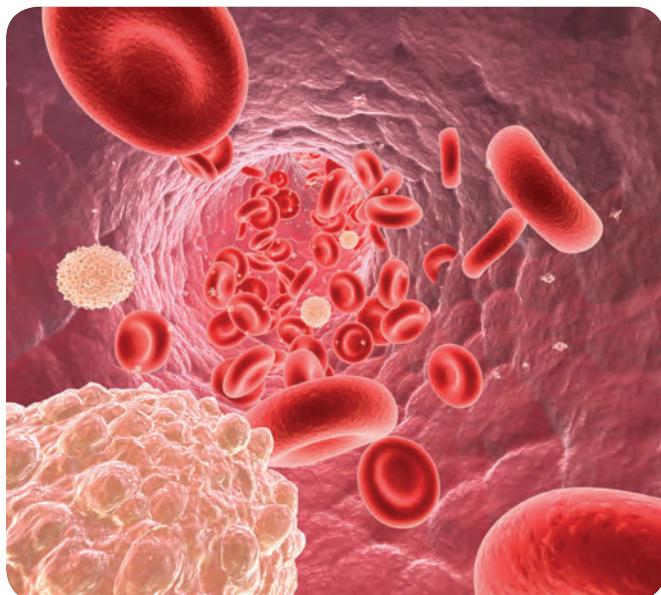
Ceramides are simple fat-soluble constituents of living cells. They naturally occur in plant and animal sources and concentrate in cell membranes. Available in Japan as a functional food that *fortifies* and *hydrates* the skin internally, cutting-edge research now reveals that ceramides confer vital benefits in three critical areas:

1. Favorably altered blood lipid profiles, including lower total cholesterol and increased beneficial HDL.²
2. Enhanced insulin sensitivity.³
3. Colon cancer defense.⁴⁻⁶

Cholesterol Control

Short- and long-term preclinical models reveal that ceramides can lower triglycerides in the blood and reduce levels of oxidized cholesterol in the liver. Collectively, these findings suggest that ceramides should be considered ***functional lipids***.

In one short-term animal study, investigators fed animals a purified diet containing ceramides for just two weeks. As a result, scientists saw a ***significant drop in serum triglyceride levels***. Since the concentration of liver triglycerides was not affected, study investigators hypothesized that dietary ceramides may modify the secretion of triglycerides from the liver and intestine and beneficially influence the activities of enzymes that break down cholesterol and fats in the liver and other tissues.⁷



In a separate long-term animal study, diets supplemented with either ceramides plus soybean oil or 5% soybean oil were fed to rats through two generations. Total cholesterol in the ceramide-supplemented group decreased by about **30%**.⁸

In mice fed a Western-type diet, dietary ceramides reduced plasma cholesterol and triglycerides by **57%** and **58%**, respectively. Just as important, ceramides decreased the absorption of dietary cholesterol by **50%** and free fatty acids by **40%**. In addition, the livers of supplemented mice contained **61%** less oxidized cholesterol and **56%** less triglycerides than livers of control mice.⁹

Concentrations of the ***amyloid*** protein in the blood, a marker of liver inflammation, and ***alanine aminotransferase***, an enzyme elevated in damaged livers, decreased by **74%** and **79%**, respectively, in the ceramide-supplemented mice. Thus, oral intake of ceramides was shown to lower plasma cholesterol and triglycerides and to protect the liver from fat- and cholesterol-induced fatty-liver disease.⁹

One study found that treating certain cultured cell lines with ceramides significantly increased their ability to clear out or “efflux” cholesterol.¹⁰ This could have implications for cholesterol removal from arterial plaque.

Enhanced Insulin Sensitivity

Chronic consumption of high-energy diets leads to obesity and consequently to insulin resistance. This in turn results in the deadly metabolic syndrome and may speed onset of other metabolic-related disorders, including ***non-alcoholic fatty liver disease***.^{11,12} Although metabolic syndrome can be managed by lifestyle improvements, including low-glycemic meals and exercise, most people need additional support. Recent research suggests that increased ceramide intake can help prevent ***insulin resistance*** and reduce your risk of obesity.

Results of a recent animal model showed that dietary ceramides induced normalization of adiponectin signaling followed by promotion of ***insulin sensitivity*** as plasma insulin levels decreased.³ (Adiponectin is a hormone that aids in glucose breakdown and governs the amount of energy stored as fat in the body.)

Researchers fed experimentally obese rats two diets: one that contained pure ceramides of *animal* origin and another that contained pure ceramides of *plant* origin. After **45** days, both diets led to significant reductions in hepatic lipid and plasma non-HDL cholesterol. Importantly, both diets decreased plasma insulin levels, while only the plant ceramide-supplemented diet increased the plasma adiponectin level.

Study investigators concluded that dietary ceramides, regardless of origin and chemical composition, might prevent fatty liver and high cholesterol through improvement of adiponectin signaling and consequent *improvement in insulin sensitivity*.³

Colon Cancer Prevention

To examine the potential anti-cancer effects of ceramide-based supplements, investigators fed mice ceramides before and after experimentally induced tumor initiation. The result? ***Drastically reduced colon tumor formation*** in both groups, which suggests that *ceramides are as effective in preventing tumor formation as they are in inhibiting further growth of tumors already present in the colon*.⁵

Numerous studies have shown that feeding dietary ceramides to laboratory animals inhibits colon carcinogenesis.¹³⁻¹⁵ Oral ceramides appear to favorably affect changes in cell proliferation and cell death that are important events in early colon carcinogenesis.¹⁶ While ceramides have been proposed as a messenger for cellular processes as diverse as differentiation, proliferation, senescence, and cell cycle arrest, a number of studies have focused on their role in apoptosis (programmed cell death) in cancer cells.¹⁶⁻¹⁸

Another possible mechanism of action of ceramides in suppressing colon cancer development is that they bypass a signaling defect that is required for cancer development. Indirect evidence suggests that *ceramides can inhibit colon cancer in humans* and have been shown to induce apoptosis in a human cancer cell line. Feeding ceramides to mice has also been shown to *reduce* the number of colon tumors.⁴

In another study, animals fed a known carcinogen and then given a ceramide-based lipid compound experienced a **70%** reduction in the number of ***aberrant crypt foci***.¹⁹ Research has established that a percentage of these abnormal tube-like structures eventually develop into full-blown cancer.^{20,21} These findings demonstrate that oral ingestion of ceramides can *halt* colon cancer development *before* it takes hold.

Oral Ceramides: Molecular Skin Regenerators

During the early 1990s, major cosmetic companies formulated and marketed ceramide-based ***topical*** skin-care products for treating fine lines, wrinkles, and dryness. Due to their moisture-retaining properties, ceramides were eventually added to foundation makeup and lipsticks to help moisturize and protect



System-Wide Benefits of Ceramides

- Known for their ability to support aging skin, a growing body of scientific research reveals that *ceramides*—a family of lipid molecules naturally occurring in cell membranes—represent a new class of *functional* lipids.
- They have recently been shown to influence cell growth, differentiation, and death.
- Orally ingested ceramides are proving to be powerful new weapons against several age-related pathologies, including high cholesterol, insulin resistance, and colorectal cancer.
- Numerous studies have shown that oral supplementation with ceramides can lower LDL and triglyceride levels, raise beneficial HDL, and enhance insulin sensitivity.
- A growing body of research shows that ingesting ceramides can protect against the formation of pre-cancerous and cancerous growths in the colon.
- A proprietary, non-GMO oral ceramide formula also produced dramatic improvements in the hydration, elasticity, and health of dry, flaky, itchy skin, with complete elimination of dryness reported by **95%** of study subjects.
- Ceramides also effectively combat bacterial infection of the skin, dermatitis, and eczema.

skin exposed to sun, wind, environmental chemicals, and the ravages of aging.

While Western cosmetic companies were focusing on topical ceramide products, Japanese nutraceutical firms began employing a more innovative approach to ceramide therapy—*oral* delivery of ceramides in capsules, functional foods, and beverages.

Oral ceramide supplements received Japanese government approval for general use in 2000, although Japanese women had been ingesting concentrated ceramides in *Konjac tuber*, a centuries-old staple of the Asian diet.²²

Orally ingested ceramides have been shown to directly replace the ceramides lost through normal cell shedding, skin damage, and aging. Oral ceramides have been shown to specifically target the *stratum corneum* layer of the epidermis with “smart bomb” accuracy. This targeted moisturizing effect results from post-prandial (after-meal) ceramides being carried directly to the *stratum corneum* via the blood. Recent research suggests this internal delivery method improves the functionality of ingested ceramides and produces results not seen in cosmetic topical applications.²³

Why Your Aging Skin Needs Additional Ceramides

More than just a cosmetic problem, skin aging exposes you to significant health risks from infectious microorganisms, UV radiation, defective permeability to topical drugs, and increased susceptibility to contact dermatitis from environmental chemicals. You also need your skin to be at its *functional* best in order to properly regulate body temperature, synthesize optimal amounts of vitamin D, and provide critical sensory input from the environment. *The problem is that it is virtually impossible to obtain ceramides in sufficient quantity and concentration to get the full range of benefits from dietary sources alone.*

Both *in vitro*^{24,25} and *in vivo*^{1,26} studies demonstrate that the moisture content of the *stratum corneum* in aging humans is decreased.²⁷ In maturing individuals, the *stratum corneum* is also susceptible to inflammation and infection. Research shows that aging skin also suffers from reduced *structural* integrity due to the lower lipid content—mostly a lower proportion of ceramides.^{25,27,28}

Studies confirm the decline of the ceramide content in aging human skin,²⁹ possibly due to a decline in enzyme activity that helps to deliver ceramides in usable form to the skin.³⁰ When aging skin’s ability to make ceramides diminishes, as it inevitably does, increased *ceramide* intake becomes *essential*. Increased ceramide intake is required to reverse an

increased susceptibility to environmental assaults (e.g., decreased humidity, solvents, and detergents) and a diminished capacity to recover from environmental insults.³¹

Studies show that **drug permeability** in the aged human *stratum corneum* is significantly altered. Specifically, the ability of aging skin to absorb lipid-soluble topical applications (including drugs) is greatly diminished.³² Maintaining an optimal concentration of ceramides in the *stratum corneum* is thus indispensable for supporting not only healthy skin structure, but also for maintaining healthy skin function and optimal responsiveness to delivery of topical drugs.

Skin Health: Clinical Studies

A double-blind placebo-controlled study was conducted at Osaka City University to evaluate the effects of 6 weeks of treatment with oral ceramide supplements in 33 patients (6 men and 27 women) suffering from chronically dry, rough skin. The test supplement was given in the form of soft capsules containing



40 mg per day of rice bran-derived ceramides. Study investigators concluded that oral delivery of natural, plant-based ceramides was safe and was directly delivered to the stratum corneum:

"Experiments have shown that after oral administration plant-based ceramides are absorbed unchanged in the small intestine.... The substance is then transported by the capillaries into the horny layer and the keratin intercellular spaces. The supplements containing rice ceramides as used in this study, in contrast to the ceramide substances distributed in animal brains, provide superior supplementation that can be expected to be both safe and effective for oral administration."²²

In another clinical study, a proprietary, ceramide-rich lipid formula made from non-GMO wheat showed exceptional promise in rehydrating even chronically dry, thin, itchy skin. At the end of a 4-week, placebo-controlled pilot study to determine the formula's tolerability and clinical efficacy, **65%** of participants treated with **80 mg** per day of a proprietary wheat ceramide formula experienced an increase in skin moisture compared with only **45%** of the placebo group. Because it takes about **4 weeks**—the entire length of the pilot study—for newly formed skin cells to migrate to the *stratum corneum*, improvements observed in this short time period were deemed very promising by study investigators.¹

A 90-day follow-up study tracked subjects who were recruited because of chronically dry skin, including those suffering from chronic itching. The study consisted of subjective evaluation by the participants as well as objective dermatological measurements of skin roughness, itching, flaking and hydration, determined by a test of electrical impedance and by laboratory tissue analysis. Active treatment consisted of **200 mg** per day of the wheat ceramide formula vs. placebo. By the end of the study, participants treated with the ceramide-rich wheat extract experienced *significant softening of their skin*.¹

Electrical assessment of skin hydration showed improvement in **95%** of the treatment group compared with no statistically significant change in the placebo group. All participants who had previously experienced chronic itching reported sharply decreased itch or complete elimination of the complaint at the study's conclusion. Dermatological evaluation revealed a significant reduction of *squames* (flaking patches of skin) in the treatment group com-



pared with the placebo group. When subsets of participants from both the active treatment and placebo groups were further examined, *levels of protective lipids increased in leg tissue samples in the treatment group* while no statistically significant change in levels of protective lipids was noted in the placebo group.¹

A recent double-blind, randomized, placebo-controlled study was carried out on 51 women aged **20-63** years with dry to very dry skin who received either **350 mg** of a proprietary wheat-derived ceramide extract or placebo for **3 months**.³³ Evaluation of skin hydration on legs, arms, and face, assessed at baseline and at the study's end, was performed using dermatological scores (dryness, roughness, reddening), skin hydration measurement, and self-assessment scores. Skin hydration was significantly increased at the end of the study on the arms and legs in the ceramide-treatment group compared with the placebo group. Skin dryness and redness was reduced in the treatment group,

In another clinical study, a proprietary, ceramide-rich lipid formula made from non-GMO wheat showed exceptional promise in rehydrating even chronically dry, thin, itchy skin.

which also noted improvement in overall skin hydration. Study investigators concluded that the wheat-ceramide extract capsules were well tolerated by study participants.

Blocking Bacterial Infection

The skin surface represents our primary barrier to the external environment, and as such, it is our *first line of defense* against microbial infection. Lipids at the skin's surface, including ceramides, comprise a major part of an antimicrobial barrier. When this barrier becomes compromised, as it inevitably does with age, numerous health conditions can arise.

In *atopic dermatitis*, for example, ceramide concentrations in the *stratum corneum* are diminished.³⁴ Individuals with atopic dermatitis generally have higher concentrations of bacteria, especially *Staphylococcus aureus*, on the skin surface.³⁵

A recent study confirmed that increased colonization by the bacteria *Staphylococcus aureus* in atopic dermatitis is correlated with the reduction in ceramides.³⁶ Frequently present on the skin surface, *Staphylococcus aureus* has significant potential for causing infections if the skin barrier function is

disrupted or if the surface environment is otherwise altered.³⁷⁻³⁹ *S. pyogenes* is another common cause of potentially serious skin infections, including **erysipelas** and **cellulitis**, which are characterized by the spread of the bacteria into the deep layers of the skin.⁴⁰ *Pseudomonas aeruginosa*, another opportunistic bacterium, can infect skin wounds or functionally compromised regions of the skin.⁴¹

Relief from Dermatitis and Eczema

Atopic dermatitis, like other inflammatory skin conditions, is an immunologic-related condition. Accordingly, topical corticosteroids and other immunosuppressive agents are mainstays of therapy, but the risk of toxicity from these agents is significant, particularly in children. One study designed to investigate the pathogenesis of allergic contact dermatitis and other inflammatory skin conditions found that repairing the breakdown in the ceramide barrier while continuing topical medications could alleviate childhood atopic dermatitis.⁴²

In the quest to find safer therapies for contact dermatitis, investigators treated **580** consecutive patients suffering from contact or irritant dermatitis with a

What are Ceramides?

Found in plant and animal sources, and also synthesized by the body, ceramides form an essential component of human skin.⁴⁶ The 6 forms of ceramides commonly found in skin are formed via a biosynthetic reaction in the top layer of the skin, the epidermis. All 4 layers of the epidermis contain ceramides, and they play a critical role in skin health by creating a barrier that reduces infection and helps to retain the skin's moisture.²²

All humans require the **permeability barrier** that skin provides, and this barrier is localized to the top layer of the skin called the *stratum corneum*, where extracellular matrix lipids inhibit loss of water.⁴⁷ Over a period of **4 weeks**, new cells created at the deepest epidermal layer migrate upwards to form the *stratum corneum*. By the time skin cells reach the skin's surface, most are technically dead. They become *cornified* ("horn-like"), transforming into protein-rich blocks tightly bound together by a layer of cement composed of various lipids, about **35-40%** of which are **ceramides**.⁴⁸

The primary function of the epidermis is to generate a relatively impermeable layer to protect living

creatures from dehydration and environmental stress. Ceramides play a critical role in the barrier function and in the retention of water by the *stratum corneum*.

A reduction in the amount of ceramides in the epidermal layers results in dry skin and dermatitis, and is a *major cause of wrinkles*.²² Studies have shown that optimal amounts of ceramides in relation to other lipids in the top layer of the skin are required to maintain healthy skin.⁴⁹ The *stratum corneum* keeps the rate of water loss to the environment to a minimum.

Interestingly, nicotinamide (**vitamin B3**) applied to the skin has been shown to increase the biosynthesis of ceramides in the *stratum corneum* and improve the epidermal permeability barrier.⁵⁰

The beneficial properties of **ceramides** aren't limited to skin cells. They're found *throughout* the body, where they regulate cell proliferation, function, and development across a range of physiological systems. For example, ceramides play important roles as signaling molecules involved in such vital cellular functions as apoptosis,^{51,52} cell growth,⁵³ and differentiation.^{54,55}

skin lipid mixture containing ceramides alone or in combination with topical corticosteroids until abatement for 8 weeks. Statistically significant improvement was seen in both treatment groups at weeks 4 and 8 as compared to baseline. Individuals who used ceramides in combination with topical corticosteroids experienced greater relief, compared with those who used topical corticosteroids alone.⁴³

Another study evaluated the use of topical (synthetic skin lipids) and natural ceramides to treat **detergent-induced dermatitis**. Study results showed that although the concomitant use of both products afforded protection of healthy human skin against detergent-induced dermatitis, slightly better results were obtained with a mixture of natural ceramides than with synthetic skin lipids. Investigators believe that skin lipid supplementation using oral ceramide extracts is effective in ameliorating detergent-induced dermatitis because of their structural resemblance to the lipids in the *stratum corneum*.⁴⁴

Ceramide therapy has also proven to be effective in combating the itching and inflammation caused by **eczema**. In addition, ceramide treatment has been shown to *normalize* skin surface lipids and reduce symptoms in patients afflicted with this condition.⁴⁵

Summary

Known for their ability to support aging skin, a growing body of scientific research reveals that *ceramides*—a family of lipid molecules naturally occurring in your skin—represent a new class of *functional* lipids. They have recently been shown to exert profound control over cell growth, differentiation, and death. Orally ingested ceramides are proving to be powerful new weapons against several age-related pathologies, including high cholesterol, insulin resistance, and colorectal cancer development.

Numerous studies have shown that oral supplementation with ceramides can lower LDL and triglyceride levels, raise beneficial HDL, enhance insulin sensitivity, and thwart formation of pre-cancerous and cancerous growths in the colon.

A proprietary, non-GMO oral ceramide formula has also yielded dramatic improvements in the hydration, elasticity, and youthful appearance of dry, flaky, itchy skin, with complete elimination of dryness reported by 95% of study subjects. ●

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

- Boisnic S, Branchet M-C. Intérêt clinique d'un ingrédient alimentaire à visée hydratante: Lipowheat™. Etude randomisée en double aveugle versus placebo. *J Med Esth et Chir Derm.* 2007 Dec; 34(136):239-42
- Vesper H, Schmelz EM, Nikolova-Karakashian MN, Dillehay DL, Lynch DV, Merrill AH. Sphingolipids in food and the emerging importance of sphingolipids to nutrition. *J Nutr.* 1999 Jul;129(7):1239-50.
- Yunoki K, Renaguli M, Kinoshita M, et al. Dietary sphingolipids ameliorate disorders of lipid metabolism in Zucker fatty rats. *J Agric Food Chem.* 2010 Jun 9;58(11):7030-5.
- Berra B, Colombo I, Sottocornola E, Giacosa A. Dietary sphingolipids in colorectal cancer prevention. *Eur J Cancer Prev.* 2002;112:193-7.
- Lemonnier LA, Dillehay DL, Vespremi MJ, Abrams J, Brody E, Schmelz EM. Sphingomyelin in the suppression of colon tumors: prevention versus intervention. *Arch Biochem Biophys.* 2003 Nov 15;419(2):129-38.
- Symolon H, Schmelz EM, Dillehay DL, Merrill AH. Dietary soy sphingolipids suppress tumorigenesis and gene expression in 1,2-dimethylhydrazine-treated CF1 mice and ApcMin/+ mice. *J Nutr.* 2004 May;134(5):1157-61.
- Imaiizumi K, Tominaga A, Sato M, Sugano M. Effects of dietary sphingolipids on levels of serum and liver lipids in rats. *Nutr Res.* 1992 Apr-May;12(4-5):543-8.
- Kobayashi T, Shimizugawa T, Osakabe T, Watanabe S, Okuyama H. A long-term feeding of sphingolipids affected the levels of plasma cholesterol and hepatic triacylglycerol but not tissue phospholipids and sphingolipids. *Nutr Res.* 1997;17(1):111-4.

9. Duivenvoorden I, Voshol PJ, Rensen PC, et al. Dietary sphingolipids lower plasma cholesterol and triacylglycerol and prevent liver steatosis in APOE*3Leiden mice. *Am J Clin Nutr.* 2006 Aug;84(2):312-21.
10. Witting SR, Maiorano JN, Davidson WS. Ceramide enhances cholesterol efflux to apolipoprotein A-I by increasing the cell surface presence of ATP-binding cassette transporter A1. *J Biol Chem.* 2003 Oct 10;278(41):40121-7.
11. Ziemke F, Mantzoros CS. Adiponectin in insulin resistance: lessons from translational research. *Am J Clin Nutr.* 2010 Jan;91(1):258S-261S.
12. Lu JY, Huang KC, Chang LC, et al. Adiponectin: a biomarker of obesity-induced insulin resistance in adipose tissue and beyond. *J Biomed Sci.* 2008 Sep;15(5):565-76.
13. Moschetta A, Portincasa P, van Erpecum KJ, Debelleis L, Vanberge-Henegouwen GP, Palasciano G. Sphingomyelin protects against apoptosis and hyperproliferation induced by deoxycholate: potential implications for colon cancer. *Dig Dis Sci.* 2003 Jun;48(6):1094-101.
14. Zhang P, Li B, Gao S, Duan RD. Dietary sphingomyelin inhibits colonic tumorigenesis with an up-regulation of alkaline sphingomyelinase expression in ICR mice. *Anticancer Res.* 2008 Nov-Dec;28(6A):3631-5.
15. Hu Y, Le Leu RK, Belobrajdic D, Young GP. The potential of sphingomyelin as a chemopreventive agent in AOM-induced colon cancer model: wild-type and p53^{+/−} mice. *Mol Nutr Food Res.* 2008 May;52(5):558-66.
16. Schmelz EM. Sphingolipids in the chemoprevention of colon cancer. *Front Biosci.* 2004 Sep 1;9:2632-9.
17. Hannun YA, Luberto C, Argraves KM. Enzymes of sphingolipid metabolism: from modular to integrative signaling. *Biochemistry.* 2001 Apr 24;40(16):4893-903.
18. Mathias S, Peña LA, Kolesnick RN. Signal transduction of stress via ceramide. *Biochem J.* 1998 Nov 1;335(Pt 3):465-80.
19. Schmelz EM, Dillehay DL, Webb SK, Reiter A, Adams J, Merrill AH Jr. Sphingomyelin consumption suppresses aberrant colonic crypt foci and increases the proportion of adenomas versus adenocarcinomas in CF1 mice treated with 1,2-dimethylhydrazine: implications for dietary sphingolipids and colon carcinogenesis. *Cancer Res.* 1996 Nov 1;56(21):4936-41.
20. Bird RP, Good CK. The significance of aberrant crypt foci in understanding the pathogenesis of colon cancer. *Toxicol Lett.* 2000 Mar 15;112-113:395-402.
21. Minkin S. Statistical analysis of aberrant crypt assays for colon cancer promotion studies. *Biometrics.* 1994 Mar;50(1):279-88.
22. Available at: www.fda.gov/ohrms/dockets/dockets/95s0316/95s-0316-rpt0275-04-Udell-vol211.pdf. Accessed November 15, 2010.
23. Boisnic, Beranger JY, Branchet MC. Anti-elastase and anti-radicalar effect of ceramides. Product Research Report. Hitex.
24. Menon GK, Feingold KR, Moser AH, Brown BE, Elias PM. De novo sterogenesis in the skin. II. Regulation by cutaneous barrier requirements. *J Lipid Res.* 1985 Apr;26(4):418-27.
25. Leveque JL, Corcuff P, de Rigal J, Agache P. In vivo studies of the evolution of physical properties of the human skin with age. *Int J Dermatol.* 1984 Jun;23(5):322-9.
26. Elsner P, Wilhelm D, Maibach HI. Frictional properties of human forearm and vulvar skin: influence of age and correlation with transepidermal water loss and capacitance. *Dermatologica.* 1990;181(2):88-91.
27. Potts RO, Buras EM, Chrisman DA Jr. Changes with age in the moisture content of human skin. *J Invest Dermatol.* 1984 Jan;82(1):97-100.
28. Long CC, Marks R. Stratum corneum changes in patients with senile pruritus. *J Am Acad Dermatol.* 1992 Oct;27(4):560-4.
29. Imokawa G, Abe A, Jin K, Higaki Y, Kawashima M, Hidano A. Decreased level of ceramides in stratum corneum of atopic dermatitis: an etiologic factor in atopic dry skin? *J Invest Dermatol.* 1991 Apr;96(4):523-6.
30. Yamamura T, Tezuka T. Change in sphingomyelinase activity in human epidermis during aging. *J Dermatol Sci.* 1990 Mar;1(2):79-83.
31. Proksch E, Brandner JM, Jensen JM. The skin: an indispensable barrier. *Exp Dermatol.* 2008 Dec;17(12):1063-72.
32. Malkinson FD. Studies on the percutaneous absorption of C14 labeled steroids by use of the gas-flow cell. *J Invest Dermatol.* 1958 Jul;31(1):19-28.
33. Guillou S, Ghabri S, Jannot C, Gaillard E, Lamour I, Boisnic S. The moisturizing effect of a wheat extract food supplement on women's skin: a randomized, double-blind placebo-controlled trial. *Int J Cosmet Sci.* 2010 Jul 14.
34. Imokawa G. Lipid abnormalities in atopic dermatitis. *J Am Acad Dermatol.* 2001 Jul;45(1 Suppl):S29-32.
35. Abeck D, Mempel M. *Staphylococcus aureus* colonization in atopic dermatitis and its therapeutic implications. *Br J Dermatol.* 1998 Dec;139 Suppl 53:13-6.
36. Arikawa J, Ishibashi M, Kawashima M, Takagi Y, Ichikawa Y, Imokawa G. Decreased levels of sphingosine, a natural antimicrobial agent, may be associated with vulnerability of the stratum corneum from patients with atopic dermatitis to colonization by *Staphylococcus aureus*. *J Invest Dermatol.* 2002 Aug;119(2):433-9.
37. Thestrup-Pedersen K. Bacteria and the skin: clinical practice and therapy update. *Br J Dermatol.* 1998 Dec;139 Suppl 53:1-3.
38. Ladhanı S. Recent developments in staphylococcal scalded skin syndrome. *Clin Microbiol Infect.* 2001 Jun;7(6):301-7.
39. Oncul O, Yüksel F, Altunay H, Açıkel C, Celiköz B, Cavu lu S. The evaluation of nosocomial infection during 1-year-period in the burn unit of a training hospital in Istanbul, Turkey. *Burns.* 2002 Dec;28(8):738-44.
40. Kolmos HJ, Svendsen RN, Nielsen SV. The surgical team as a source of postoperative wound infections caused by *Streptococcus pyogenes*. *J Hosp Infect.* 1997 Mar;35(3):207-14.
41. Murthy R, Sengupta S, Maya N, Shivananda PG. Incidence of post operative wound infection and their antibiogram in a teaching and referral hospital. *Indian J Med Sci.* 1998 Dec;52(12):553-5.
42. Chamlin SL, Kao J, Frieden IJ, et al. Ceramide-dominant barrier repair lipids alleviate childhood atopic dermatitis: changes in barrier function provide a sensitive indicator of disease activity. *J Am Acad Dermatol.* 2002 Aug;47(2):198-208.
43. Berardesca E, Barbareschi M, Veraldi S, Pimpinelli N. Evaluation of efficacy of a skin lipid mixture in patients with irritant contact dermatitis, allergic contact dermatitis or atopic dermatitis: a multicenter study. *Contact Dermatitis.* 2001 Nov;45(5):280-5.
44. Coderch L, De Pera M, Fonollosa J, De La Maza A, Parra J. Efficacy of stratum corneum lipid supplementation on human skin. *Contact Dermatitis.* 2002 Sep;47(3):139-46.
45. Eichenfield LF, Fowler JF, Rigel DS, Taylor SC. Natural advances in eczema care. *Cutis.* 2007 Dec;80(6 Suppl):2-16.
46. Novotný J, Hrabálek A, Vávrová K. Synthesis and structure-activity relationships of skin ceramides. *Curr Med Chem.* 2010;17(21):2301-24.
47. Goldstein AM, Abramovits W. Ceramides and the stratum corneum: structure, function, and new methods to promote repair. *Int J Dermatol.* 2003 Apr;42(4):256-9.
48. Feingold KR. The regulation and role of epidermal lipid synthesis. *Adv Lipid Res.* 1991;24:57-82.
49. Zettersten EM, Ghadially R, Feingold KR, Crumrine D, Elias PM. Optimal ratios of topical stratum corneum lipids improve barrier recovery in chronologically aged skin. *J Am Acad Dermatol.* 1997 Sep;37(3 Pt 1):403-8.
50. Tanno O, Ota Y, Kitamura N, Katsume T, Inoue S. Nicotinamide increases biosynthesis of ceramides as well as other stratum corneum lipids to improve the epidermal permeability barrier. *Br J Dermatol.* 2000 Sep;143(3):524-31.
51. Hannun YA, Obeid LM. Ceramide: an intracellular signal for apoptosis. *Trends Biochem Sci.* 1995 Feb;20(2):73-7.
52. Ekiz HA, Baran Y. Therapeutic applications of bioactive sphingolipids in hematological malignancies. *Int J Cancer.* 2010 Oct 1;127(7):1497-506.
53. Hannun YA, Obeid LM. The ceramide-centric universe of lipid-mediated cell regulation: stress encounters of the lipid kind. *J Biol Chem.* 2002 Jul 19;277(29):25847-50.
54. Merrill AH. Cell regulation by sphingosine and more complex sphingolipids. *J Bioenerg Biomembr.* 1991 Feb;23(1):83-104.
55. Pitson SM. Regulation of sphingosine kinase and sphingolipid signaling. *Trends Biochem Sci.* 2010 Sep 24.

YOU'RE ONLY AS OLD AS YOU THINK —

Think Better WITH COGNITEX

It starts with forgetting where you put your car keys. Then you can't remember a loved one's birthday. A few years later it takes a moment to recall an old friend's name. Sadly, brain degeneration affects all aging adults, however, enhanced communication between neurons may hold the key to maintaining youthful cognition and memory.

Cognitex with Pregnenolone & NeuroProtection Complex provides 9 cutting-edge **brain boosting** supplements in one exciting formula!

We all strive for a youthful brain, but the key to brain power may come from **uridine-5'-monophosphate (UMP)**, a compound that is naturally found in the milk of nursing mothers and is essential to humans when their brains are the youngest — as infants. More importantly, UMP supports superior cognitive function in aging adults.

In order to bolster this improved 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.

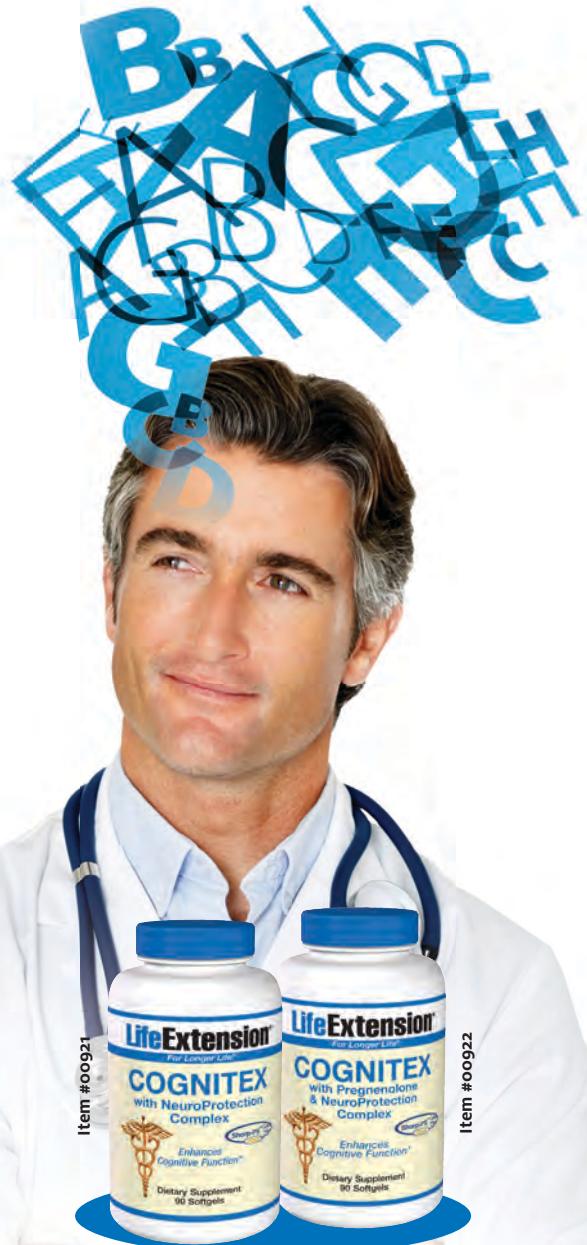
Wild blueberry extract has been added to protect against free-radical damage and **pregnenolone** may have beneficial properties as well.

In order to protect against inflammation to a healthy brain, a **proprietary NeuroProtection Complex Blend** contains standardized extracts of hops, ginger, and rosemary — all known to have anti-inflammatory capabilities.

With a healthy brain in place, the proper levels of **acetylcholine** are needed to enable brain neurons to communicate. To maintain these levels, Cognitex includes **alpha-glyceryl phosphoryl choline (A-GPC)** to boost acetylcholine and **Sensoril® ashwagandha extract** to inhibit an enzyme that degrades acetylcholine in the aging brain.

The retail price for 90 softgels of Cognitex (with or without pregnenolone) is \$74 (item #00922) and \$72 (item #00921), respectively. If a member orders four bottles of either version during **Super Sale**, the price per bottle is reduced to just **\$44.96** and **\$43.20**, respectively.

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



Just three softgels of Cognitex provide the following nutrients:

Alpha-Glyceryl Phosphoryl Choline (A-GPC)	600 mg
Phosphatidylserine-DHA (PS-DHA) [Sharp-PS® GOLD Conjugated Phosphatidylserine-DHA]	100 mg
Pregnenolone	50 mg
Vinpocetine	20 mg
Phospholipid-Grape Seed Extract	150 mg
Wild Blueberry Extract (Vaccinium angustifolium)	150 mg
Sensoril® Ashwagandha Extract (Withania somnifera)	125 mg
Uridine-5'-Monophosphate (disodium)	50 mg
Proprietary NeuroProtection Complex Blend Perluxan® Hops Extract (<i>Humulus lupulus</i>) Ginger (<i>Zingiber officinale</i>) Extract Rosemary (<i>Rosmarinus officinalis</i>) Extract	125 mg

Caution: Cognitex is also available **without** pregnenolone for those with existing steroid hormone-sensitive cancer.

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Contains fish (wild herring, blue whiting), soybeans, and rice.

**NEW
LOWER
PRICES!**

SAMe FOR BRAIN HEALTH

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.¹

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**.

It is important to note that not all SAMe is the same. The higher-quality SAMe is standardized for the **active SS isomer**. The less potent SAMe, on the other hand, predominantly contains the *inactive* RS isomer.



Life Extension only sells the higher-grade and more potent **SS isomer**. 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 \$32. When a member buys six boxes during **Super Sale**, the price is reduced to only **\$16.88** a box—a **savings of 40%**!

(SAMe is also available in bottles containing 50 400 mg tablets. Retail price is \$72. If a member buys four bottles during Super Sale, the price is reduced to \$44.55 per bottle.)

References

1. Am J Psychiatry. 2010 Aug;167(8):942-8.
2. Naunyn Schmiedebergs Arch Pharmacol. 2000 Jan; 361 (1): 47-52.

To order your supply of premium-grade SAMe, call 1-800-544-4440 or visit www.LifeExtension.com



Why CERAMIDES Benefit More Than Just the Skin

Ceramides are essential for preserving healthy-looking skin.^{1,2} That's why they're included in so many anti-aging face creams.

Your body's production of **ceramides** declines with age.³ That's bad news, since ceramides make up **35-40%** of the binding matrix that maintains moisture balance and protects the skin's surface.⁴ It's therefore critical that ceramides lost to aging are replaced.

What has impressed scientists are recent studies showing that ceramides benefit far more than the skin. Ceramides are found *throughout* the body and support healthy cell proliferation, function, and development.^{5,6} A growing body of published studies reveals that orally ingested ceramides can:

- Support blood lipid profiles already within normal range, including total cholesterol and beneficial HDL.⁷
- Promote healthy glucose metabolism already within normal range.⁸
- Support healthy colon cell division.⁹⁻¹¹

Restore Ceramides Naturally from Within!

The **ceramides** that young skin naturally produces to retain its supple appearance are identical to those present in **wheat**!

Wheat-derived oils have been used *topically* for centuries as a natural moisturizer. But you can't get enough ceramides from topically applied wheat oil to have a long-term impact on your skin's appearance. And they don't appear in sufficient concentration in your diet.

That's why **Life Extension**[®] brought together these skin-nourishing oils in a new concentrated **oral formula** called **Skin Restoring Ceramides with Lipowheat™**.

Lipowheat™ is a proprietary **ceramide blend** that offers nutritional support for aging skin to complement the topical products you may already be using.

The Moisturizing Pill the Japanese Have Enjoyed for a Decade!

Lipowheat™ ceramides have been available to Japanese women as a functional food since 2000.¹² The hydrating action of **Lipowheat™ ceramides** have proven effective in clinical trials.

To take one example, after just three months ingesting **200 mg** per day of **Lipowheat™**, a group of people suffering from dry, flaking skin reported dramatic improvement in the look and feel of their skin. These results were verified by electrochemical analysis showing that **95%** of participants exhibited improved skin hydration. Even better, all subjects who at the onset of the study experienced chronic itching reported sharply decreased itching or **complete elimination** of the problem by the end of the study!^{14,15}

Aging Americans can now offset the visible impact of the gradual decline in their ability to produce enough ceramides using **Skin Restoring Ceramides with Lipowheat™**.

One bottle containing **30 350 mg** liquid capsules of **Skin Restoring Ceramides with Lipowheat™** retails for \$25. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$15.53**.

Contains wheat. Contains rice and trace amounts of gluten.
Lipowheat[®] is a trademark of LAVIPHARM Group of Companies.



Item # 01502

References

1. *Biophys Chem.* 2010 Aug;150(1-3):144-56.
2. *Chemistry and Physics of Lipids.* Apr 2007;146(2):67-75.
3. Baran R, Maibach H, eds. *Textbook of Cosmetic Dermatology*. 3rd ed. Taylor & Francis;2005:177.
4. *Int J Cosmet Sci.* 2010 Jul 14..
5. *Nat Rev Mol Cell Biol.* 2008 Feb;9(2):139-50.
6. *Am J Physiol Regul Integr Comp Physiol.* 2006;290:R11-R26.
7. *J Nutr.* 1999 Jul;129(7):1239-50.
8. *J Agric Food Chem.* 2010 Jun 9;58(11):7030-5.
9. *Eur J Cancer Prev.* 2002;11:193-7.
10. *Arch Biochem Biophys.* 2003 Nov 15;419(2):129-38.
11. *J Nutr.* 2004 May;134(5):1157-61.
12. www.fda.gov/ohrms/dockets/dockets/95s0316/95s-0316-rpt0275-04-Udell-vol211.pdf
Accessed August 10, 2010.
13. *J Med Esth and Chir Derm.* 2007 Dec; 34(136):239-42.

To order new Skin Restoring Ceramides with Lipowheat™
call 1-800-544-4440 or visit www.LifeExtension.com



Discount Prices For Premium-Quality Products

Life Extension® members are longevity enthusiasts, willing to take extraordinary steps to stave off disease, aging, and death. When members buy products from the **Life Extension Foundation Buyers Club**, they are assured of receiving the highest quality products based on the latest scientific studies that demonstrate benefits.

The large discounts available to Foundation members enable them to purchase **premium-quality** supplements at prices substantially below those charged by commercial companies.

Here are some examples of **savings** members enjoy during the annual **SUPER SALE**:

	Our Low Retail Price	SUPER SALE Member-Volume Discount Price Per Bottle
Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract 120 softgels, Item # 01482 Super-refined EPA/DHA fish oil plus sesame lignans and potent olive fruit extract to provide critical omega-3 fatty acids and essential components of the Mediterranean diet	\$32	\$16.81 (ten-bottle purchase)
Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ 100 mg, 60 softgels, Item # 01426 The superior <u>ubiquinol</u> form of CoQ10 plus an organic compound (shilajit) shown to double mitochondrial CoQ10 levels	\$62	\$35.10 (ten-bottle purchase)
Life Extension Mix™, 315 tablets, Item # 01555 High-potency multi-nutrient formula now with C3G, natural folate, and Crominex® 3+ at no extra cost	\$98	\$46.91 (ten-bottle purchase)
Optimized Resveratrol with Synergistic Grape-Berry Actives 250 mg, 60 vegetarian capsules, Item # 01430 High potency <i>trans</i> -resveratrol with quercetin, plus pterostilbene and fisetin to support DNA "longevity genes"	\$46	\$27.90 (four-bottle purchase)
Ultra Natural Prostate Formula, 60 softgels, Item # 01495 Most comprehensive formula to support normal urinary flow and help support healthy prostate function	\$38	\$21.60 (twelve-bottle purchase)
Calorie Control Weight Management Formula* 402 grams of powder, Item # 01493 Four potent ingredients to impede glucose-lipid absorption and combat age-associated weight gain	\$56	\$29.70 (eight-jar purchase)
ArthroMax™ with Theaflavins, 120 vegetarian capsules, Item # 01303 Joint support formula with theaflavins from black tea	\$44	\$27 (four-bottle purchase)
PQQ Caps with BioPQQ™, 10 mg, 30 vegetarian capsules, Item # 01500 Promotes mitochondrial biogenesis (generation of new mitochondria)	\$24	\$14.85 (four-bottle purchase)
DHEA (Dehydroepiandrosterone), 25 mg, 100 capsules, Item # 00335 A hormone that declines with aging, benefits overall health	\$15	\$8.44 (four-bottle purchase)
Mitochondrial Energy Optimizer with BioPQQ™, 120 capsules, Item # 01568 To maintain healthy cellular function, protein structural integrity, and mitochondrial biogenesis	\$94	\$56.70 (four-bottle purchase)
SAME, 400 mg, 20 tablets, Item # 00557 S-adenosylmethionine from Europe in double-strength potency for mood elevation	\$32	\$16.88 (six-box purchase)
Super Zeaxanthin with Lutein, Meso-Zeaxanthin Plus Astaxanthin and C3G, 60 softgels, Item # 01586 Supports night vision and macular density	\$42	\$25.65 (four-bottle purchase)

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.

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

To order call toll-free 1-800-544-4440

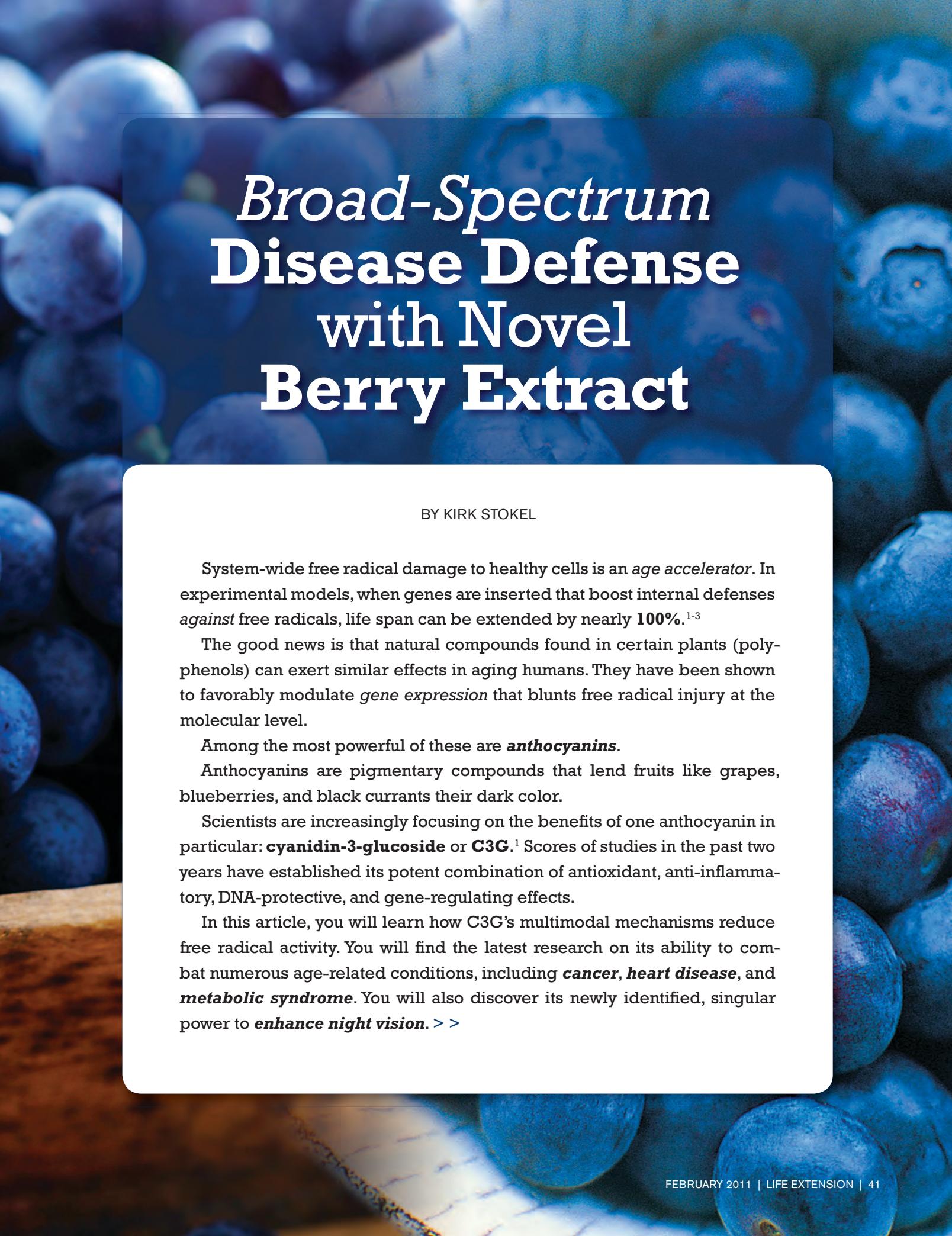
		Our Low Retail Price	SUPER SALE Member-Volume Discount Price Per Bottle
Vitamin D3 with Sea-Iodine™, 5000 IU, 60 vegetarian capsules, Item # 01372	\$14	\$8.44 (four-bottle purchase)	
High-potency vitamin D to assure adequate intake of this essential nutrient plus 1000 mcg of Sea-Iodine™			
Super R-Lipoic Acid, 300 mg, 60 vegetarian capsules, Item # 01208	\$49	\$30.38 (four-bottle purchase)	
Superior efficacy compared to alpha-lipoic acid—supplies 210 mg of stabilized R-lipoic acid			
Optimized Tryptopure® Plus, 90 vegetarian capsules, Item # 01202	\$40	\$24.30 (four-bottle purchase)	
For natural support of healthy serotonin levels in the brain, includes co-factors that protect tryptophan from degrading in the bloodstream before it crosses the blood-brain barrier			
Cognitex with NeuroProtection Complex	\$74	\$43.20 (twelve-bottle purchase)	
90 softgels, Item # 00922			
Optimal support for the brain, includes glyceryl-phosphoryl-choline, vinpocetine, phosphatidylserine, Sharp-PS® GOLD PS-DHA, uridine, and others			
Optimized Irvingia with Phase 3™ Calorie Control Complex*	\$64	\$40.50 (four-bottle purchase)	
120 vegetarian capsules, Item # 01492			
Combats age-related fat accumulation via eight distinct mechanisms			
Acetyl-L-Carnitine Arginate, 100 capsules, Item # 00788	\$59	\$34.42 (four-bottle purchase)	
Patented form of carnitine to support healthy neurite growth for optimal brain health			
Triple Action Cruciferous Vegetable Extract	\$24	\$14.85 (four-bottle purchase)	
60 vegetarian capsules, Item # 01468			
Comprehensive cruciferous plant extract formulation, with apigenin, for optimal cellular health			
Prelox® Natural Sex for Men®, 60 tablets, Item # 01373	\$50	\$30.38 (four-bottle purchase)	
Supports healthy endothelial function and blood flow for maximum male performance			
Bone Restore, 150 capsules, Item # 00811	\$22.50	\$13.16 (four-bottle purchase)	
High-potency bone protection formula with FruiteX B® OsteoBoron®			
Mitochondrial Basics with BioPQQ™, 30 capsules, Item # 01569	\$52	\$31.05 (four-bottle purchase)	
Promotes mitochondrial biogenesis and mitochondrial function			
CinSulin® with InSea²™ and Crominex®3+	\$38	\$22.95 (four-bottle purchase)	
90 vegetarian capsules, Item # 01503			
Promotes healthy blood glucose levels			
Super MiraForte with Standardized Lignans, 120 capsules, Item # 01315	\$62	\$37.80 (four-bottle purchase)	
Supports healthy testosterone levels in men			
Natural Stress Relief, 30 vegetarian capsules, Item # 00987	\$28	\$16.20 (four-bottle purchase)	
With lemon balm extract to reduce anxiety and sleeplessness, and pure L-theanine to promote relaxation without drowsiness			
Gamma E Tocopherol with Sesame Lignans, 60 softgels, Item # 00759	\$32	\$19.58 (four-bottle purchase)	
Provides the critical gamma tocopherol form of vitamin E plus sesame lignans to enhance the free radical scavenging benefits of alpha and gamma tocopherol			
Super Bio-Curcumin® 60 vegetarian capsules, Item # 00407	\$35	\$21.60 (four-bottle purchase)	
Super-absorbable formulation promotes healthy lipid & joint function, and healthy DNA			
Super Booster Softgels with Advanced K2 Complex	\$42	\$25.65 (four-bottle purchase)	
60 softgels, Item # 01380			
A convenient one-per-day capsule that includes optimal potencies of gamma-tocopherol, sesame lignans, lycopene, lutein, ginkgo, selenium and both forms of vitamin K2			
Skin Restoring Ceramides with Lipowheat™	\$25	\$15.53 (four-bottle purchase)	
30 liquid capsules, Item # 01502			
Rehydrates aged skin			

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.

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

Order online at www.LifeExtension.com/SuperSale





Broad-Spectrum Disease Defense with Novel Berry Extract

BY KIRK STOKEL

System-wide free radical damage to healthy cells is an *age accelerator*. In experimental models, when genes are inserted that boost internal defenses against free radicals, life span can be extended by nearly 100%.¹⁻³

The good news is that natural compounds found in certain plants (polyphenols) can exert similar effects in aging humans. They have been shown to favorably modulate *gene expression* that blunts free radical injury at the molecular level.

Among the most powerful of these are **anthocyanins**.

Anthocyanins are pigmentary compounds that lend fruits like grapes, blueberries, and black currants their dark color.

Scientists are increasingly focusing on the benefits of one anthocyanin in particular: **cyanidin-3-glucoside** or **C3G**.¹ Scores of studies in the past two years have established its potent combination of antioxidant, anti-inflammatory, DNA-protective, and gene-regulating effects.

In this article, you will learn how C3G's multimodal mechanisms reduce free radical activity. You will find the latest research on its ability to combat numerous age-related conditions, including **cancer**, **heart disease**, and **metabolic syndrome**. You will also discover its newly identified, singular power to **enhance night vision**. >>

An Exceptional Multitargeted Nutrient

Plants are relentlessly exposed to ultraviolet sunrays. To survive this daily onslaught, certain plants produce compounds that specifically reduce free radical damage. These compounds are known as **polyphenols**, a large class of biologically active molecules.⁴⁻⁶

Polyphenols are chemicals that, by their intrinsic structure, diminish the effects of free radicals on surrounding tissue.^{5,7}

The **anthocyanin** class of polyphenols is especially effective in blunting this form of damage. And C3G is the most *common* of the anthocyanins found in dark fruits—which come from plants that thrive best in **direct sunlight**, where free radicals are generated in abundance.^{8,9}

It's no accident, then, that C3G has recently been shown to provide animal and human tissues optimal defense from free radical attack, both by *preventing* their formation and by scavenging those already formed.^{7,9-12}

What has researchers so interested in **C3G**, however, is that it *also* protects from the “downstream” consequences of free radicals *at the genetic level*.

Perhaps the most subtle and intriguing effect of C3G on human tissue is its ability to **directly influence gene expression**.¹³ While we carry genes for every protein and structure in our bodies, only a few of those thousands of genes are active at any given moment. C3G selectively **upregulates** genes that confer protection on aging tissues, while *downregulating* those that cause damage (such as pro-inflammatory cytokines).^{14,15}

C3G is well-absorbed from the intestinal tract in both animals and humans, and it readily reaches therapeutic levels in the bloodstream.^{16,17}

Anti-Cancer Power

High intake of fruits and vegetables is associated with protection from most forms of cancer. One unique mechanism is attributed to the polyphenols in the **anthocyanin** family.⁷ These brightly colored molecules, including C3G, afford protection against most of the events in the cascade of cancer formation.^{18,19}

Antioxidant activity supplied by anthocyanins, including C3G, protects DNA from the damage that can initiate cancers.²⁰ Activation of so-called oncogenes (genes that induce cancer-cell reproduction) is another early step in cancer development. C3G potently inhibits a common oncogene called ***ras*** in human cells transplanted into rats.²¹

Suppression of the inflammatory “master switch” that links inflammation to cancer causation (NF-**kB**) can prevent many of the “second hits” that promote cancer development.^{22,23} C3G potently inhibits NF-**kB** in many tumor types.^{7,24}

Once a cancer gets started, it can invade local tissue and/or metastasize into other areas of the body. C3G and other anthocyanins can prevent expression of the proteins that cancer cells produce to help them invade.^{25,26}

The body's own natural defense against cancer is programmed cell death (**apoptosis**). Anthocyanins such as C3G can upregulate so-called “suicide pathways” that trigger apoptosis in cancer cells, while sparing normal tissue.^{21,27-31} This can be a key fact that can delay or even eliminate tumor growth.

Tumor cells, like all mammalian cells, go through a cycle of changes as they replicate. Anthocyanins can block the cell cycle, causing what amounts to a microscopic traffic jam and preventing cancer cells from proliferating in a coordinated fashion.³²

C3G has also been shown to take the “bite” out of cancer cells. Scientists tell us that cancer cells exist in a state known as “undifferentiated.” That means that they don’t form cohesive and functional structures



such as a lung or a liver. C3G has been found to induce normal differentiation of certain cancers, particularly dangerous melanoma cells.³³ When cancer cells differentiate, their potential to cause damage is gravely impaired.

By all of these different mechanisms, C3G has been shown to impair cancer cell growth, development, and spread in a variety of human cancers in laboratory and animal studies. C3G shows promise in mitigating breast, colon, lung, esophageal, and skin cancers.^{7,8,24,34,35}

System-Wide Cardiovascular Defense

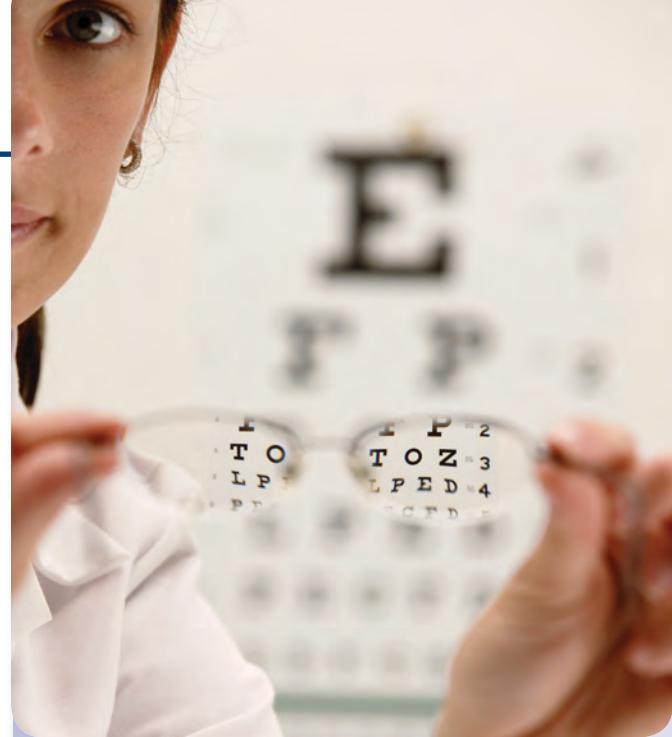
Cardiovascular disease continues to be the leading cause of preventable death in older adults. C3G offers protection at several vital levels in the chain of events leading to heart attacks and stroke.

Anthocyanins such as C3G *inhibit* nitrogen free radicals that trigger endothelial dysfunction.^{36,37} At the same time, C3G promotes healthy endothelial cells, where it contributes to vascular integrity and the ability to respond to blood pressure changes.³⁸

C3G helps reduce cholesterol levels in laboratory studies, thus lowering the risk of lipid oxidation, which triggers inflammation and atherosclerosis.³⁹ Antioxidant benefits of C3G and other anthocyanins help prevent that lipid oxidation, while also preventing the inflammation itself.⁴⁰ Once atherosclerotic plaques form, C3G can stabilize them and reduce the risk that they'll rupture and cause a catastrophic heart attack or stroke.⁴¹ Remarkably, C3G also inhibits the blood pressure-boosting hormone called angiotensin-converting enzyme (ACE), which may help keep blood pressure under control.⁴²

Combating Diabesity and the Metabolic Syndrome

The combination of obesity and diabetes has been referred to as “diabesity,” and is widely recognized as a precursor to metabolic syndrome.⁴³ Scientists have convincingly demonstrated that C3G suppresses body weight gain in animals given a high fat diet.⁴⁴ Astonishingly, the supplementation also completely normalized blood sugar and insulin elevations, and blocked elevation of the fat-associated cytokine leptin. These researchers also showed that C3G enhances secretion of beneficial cytokines such as **adiponectin**, which can help prevent progression to diabetes.⁴⁵ These effects are produced by beneficial changes in expression of hundreds of genes.¹⁵



Disease Defense with Novel Berry Extract

- Systemic free radical damage is an age accelerator—in experimental models, life span may be boosted by nearly 100% when the organism's internal free radical defenses are genetically enhanced.
- Among the most potent of *external* free-radical fighters are *anthocyanins*, polyphenols (plant-based compounds) abundant in dark fruits and vegetables.
- The predominant anthocyanin is called **C3G**, whose myriad health benefits have gained increasing scientific attention.
- C3G restores normal configuration to retinal proteins damaged by a lifetime's exposure to light and oxidant stress, potentially enhancing night vision.
- It has powerful anti-cancer effects related to its fundamental and multitargeted control of oxidant stress, inflammation, and cell growth.
- C3G plays a significant role in improving vascular function and reducing endothelial dysfunction that can lead to stroke and heart attacks.
- It also operates to minimize the risk of diabetes and metabolic syndrome by blocking intestinal absorption of carbohydrates and improving insulin sensitivity.

C3G also lowers blood sugar and enhances insulin sensitivity by downregulating a fat-related cytokine that contributes to insulin resistance.¹⁴

An astonishing and yet-to-be fully explored benefit of the anthocyanins is their ability to inhibit intestinal enzymes that break down starch for absorption. By blocking those enzymes, calories contained in starch remain in the intestinal tract and can't contribute to weight gain. C3G and others in its family offer potent suppression of intestinal alpha-glucosidase and pancreatic alpha-amylase, two enzymes that can cause excess glucose absorption to occur.⁴⁶⁻⁴⁸



Why Anthocyanins Are So Potent

Cyanin molecules take their name from their deep blue color ("cyan" is derived from the Greek word meaning "pure dark blue"). Anthocyanins, the family to which C3G belongs, impart brilliant blue-to-purple colors in many fruits and vegetables.⁴⁹ That coloration is not a coincidence; the chemical double-bonds in anthocyanins produce both their vivid color and their antioxidant activity.⁵⁰

Diets rich in anthocyanins are well-known to reduce the risks of almost all age-related chronic diseases.^{51,52} Anthocyanins are well-absorbed as intact molecules, and they also undergo changes in the intestinal tract that can enhance their protective effects.^{53,54} Those benefits are available both to otherwise healthy people and those with existing metabolic risk factors.⁵⁵ Maturing individuals should strive for intake of the equivalent of at least 5 servings of anthocyanin-rich foods daily.

C3G Restores Night Vision

The ability to see well in low-light conditions deteriorates rapidly with age, placing maturing individuals in greater danger of accidental falls, car accidents, and other preventable, injurious hazards. A primary

C3G offers protection at several vital levels in the chain of events leading to heart attacks and stroke.

cause of this so-called "night blindness" is light damage and oxidative stress in the retina. The retina is constantly exposed to highly focused beams of light, which include dangerous ultraviolet radiation.

C3G plays a unique role in protecting retinal tissue from damage. It works by multiple mechanisms at several sites in the retina. Most importantly, C3G stimulates regeneration of the retinal pigment called ***rhodopsin***.⁵⁶ Rhodopsin is vital to vision in dim light. When depleted, rhodopsin takes longer to return to its normal, light-sensitive state. C3G increases the restoration of rhodopsin levels.^{57,58}

C3G also serves to protect retinal cells against the harmful oxidation that is triggered by light.⁵⁹ It accomplishes this by reducing the accumulation of a fluorescent pigment called A2E that amasses with age and interferes with normal retinal function. C3G's ability to quench oxygen free radicals is credited with this effect.⁵⁹

Retinal cells are nerve cells that are capable of transmitting electrical signals. C3G and other cyanidin components of berries have neuroprotective effects on retinal cells.⁶⁰

Summary

Plant-based nutrients known as *anthocyanins* and their major component, **C3G**, afford aging humans multimodal protection against a broad spectrum of degenerative diseases. C3G offers comprehensive antioxidant protection, powerful control of inflammation at multiple levels, marked reduction in **DNA damage**, and beneficial regulatory effects on hundreds of vital genes. It confers real-world protection against age-related conditions ranging from **night blindness** to **cardiovascular disease, cancer, diabetes, and obesity**.

Why Humans Suffer Night Blindness

At any age, under specific conditions, humans can be easily blinded, either by extremely bright light or total darkness. This is why law enforcement officers will often shine a floodlight on individuals they wish to apprehend at night. It overwhelms the eyes' ability to make out any distinct image. This phenomenon touches specifically upon the danger of night blindness in aging humans.

Humans did not evolve the ability to see well in darkness. Aging is directly linked with a progressive and inevitable decline in your ability to see in dim-light conditions.⁶¹ The reason for this lies in the underlying mechanism of a highly reactive molecular compound unique to retinal tissue called rhodopsin.

Rhodopsin concentrates in the rod cells of the retina, which extend into the brain's visual centers. Rod cells specifically enable perception of the contrast between light and dark (as opposed to the cone cells, which govern the perception of color).

When light strikes rhodopsin, it immediately breaks down into two distinct compounds: the protein opsin and the carotenoid pigment retinal.⁶² These two

compounds generate electrochemical impulses that register in the brain as light or dark.⁶³

The problem lies in the amount of time it takes for rhodopsin to reconstitute in the eye and restore your ability to see in dark conditions.⁶⁴ Depending on your age and nutritional profile, it can take tens of minutes for the component molecules retinal and opsin to recombine into rhodopsin to restore your night vision.⁶⁴

This interval of time poses the greatest risk of nightfalls, accidents, and other hazards, as your ability to perceive light and dark is almost entirely impaired. Picture the amount of time it takes for you to make out images clearly after moving from a brightly lit room to one that is almost completely dark. Or the amount of time your eyes require to see clearly again after having been blinded by a white light.

During this period, humans are virtually blind, unable to distinguish even the nearest objects with any clarity. As you grow older, this interval of blindness increases dramatically. **C3G** promotes the regeneration of **rhodopsin**, thus helping to improve vision in dark conditions.

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

- Beckman K, Ames B. The free radical theory of aging matures. *Physiol Rev.* 1998 Apr;78(2):547-81.
- Sohal R, Weindruch R. Oxidative stress, caloric restriction, and aging. *Science.* 1996 Jul 5;273(5271):59-63.
- Rogina B, Reenan RA, Nilsen SP, Helfand SL. Extended life-span conferred by cotransporter gene mutations in *Drosophila*. *Science.* 2000 Dec 15;290(5499):2137-40.
- Flors C, Nonell S. Light and singlet oxygen in plant defense against pathogens: phototoxic phenalenone phytoalexins. *Acc Chem Res.* 2006 May;39(5):293-300.
- Kleindt CK, Stracke R, Mehrtens F, Weisshaar B. Expression analysis of flavonoid biosynthesis genes during *Arabidopsis thaliana* siliques and seed development with a primary focus on the proanthocyanidin biosynthetic pathway. *BMC Res Notes.* 2010;3:255.
- Munne-Bosch S, Jubany-Mari T, Alegre L. Enhanced photo- and antioxidative protection, and hydrogen peroxide accumulation in drought-stressed *Cistus clusii* and *Cistus albidus* plants. *Tree Physiol.* 2003 Jan;23(1):1-12.
- Ding M, Feng R, Wang SY, et al. Cyanidin-3-glucoside, a natural product derived from blackberry, exhibits chemopreventive and chemotherapeutic activity. *J Biol Chem.* 2006 Jun 23;281(25):17359-68.
- Cooke D, Schwarz M, Boocock D, et al. Effect of cyanidin-3-glucoside and an anthocyanin mixture from bilberry on adenoma development in the ApcMin mouse model of intestinal carcinogenesis--relationship with tissue anthocyanin levels. *Int J Cancer.* 2006 Nov 1;119(9):2213-20.
- Saric A, Sobocanec S, Balog T, et al. Improved antioxidant and anti-inflammatory potential in mice consuming sour cherry juice (*Prunus Cerasus* cv. Maraska). *Plant Foods Hum Nutr.* 2009 Dec;64(4):231-7.
- Guo H, Ling W, Wang Q, Liu C, Hu Y, Xia M. Cyanidin 3-glucoside protects 3T3-L1 adipocytes against H2O2- or TNF-alpha-induced insulin resistance by inhibiting c-Jun NH2-terminal kinase activation. *Biochem Pharmacol.* 2008 Mar 15;75(6):1393-401.
- Li CY, Xu HD, Zhao BT, Chang HI, Rhee HI. Gastroprotective effect of cyanidin 3-glucoside on ethanol-induced gastric lesions in rats. *Alcohol.* 2008 Dec;42(8):683-7.
- Delazar A, Khodaei L, Afshar J, Nahar L, Sarker SD. Isolation and free-radical-scavenging properties of cyanidin 3-O-glycosides from the fruits of *Ribes biebersteinii* Berl. *Acta Pharm.* 2010 Mar 1;60(1):1-11.
- Tsuda T, Ueno Y, Yoshikawa T, Kojo H, Osawa T. Microarray profiling of gene expression in human adipocytes in response to anthocyanins. *Biochem Pharmacol.* 2006 Apr 14;71(8):1184-97.
- Sasaki R, Nishimura N, Hoshino H, et al. Cyanidin 3-glucoside ameliorates hyperglycemia and insulin sensitivity due to downregulation of retinol binding protein 4 expression in diabetic mice. *Biochem Pharmacol.* 2007 Dec 3;74(11):1619-27.
- Tsuda T, Ueno Y, Kojo H, Yoshikawa T, Osawa T. Gene expression profile of isolated rat adipocytes treated with anthocyanins. *Biochim Biophys Acta.* 2005 Apr 15;1733(2-3):137-47.
- Miyazawa T, Nakagawa K, Kudo M, Muraishi K, Someya K. Direct intestinal absorption of red fruit anthocyanins, cyanidin-3-glucoside and cyanidin-3,5-diglucoside, into rats and humans. *J Agric Food Chem.* 1999 Mar;47(3):1083-91.



17. Marczylo TH, Cooke D, Brown K, Steward WP, Gescher AJ. Pharmacokinetics and metabolism of the putative cancer chemopreventive agent cyanidin-3-glucoside in mice. *Cancer Chemother Pharmacol.* 2009 Nov;64(6):1261-8.
18. Hagiwara A, Miyashita K, Nakanishi T, et al. Pronounced inhibition by a natural anthocyanin, purple corn color, of 2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP)-associated colorectal carcinogenesis in male F344 rats pretreated with 1,2-dimethylhydrazine. *Cancer Lett.* 2001 Sep 28;171(1):17-25.
19. Dai J, Gupte A, Gates L, Mumper RJ. A comprehensive study of anthocyanin-containing extracts from selected blackberry cultivars: extraction methods, stability, anticancer properties and mechanisms. *Food Chem Toxicol.* 2009 Apr;47(4):837-47.
20. Duthie SJ, Gardner PT, Morrice PC, et al. DNA stability and lipid peroxidation in vitamin E-deficient rats in vivo and colon cells in vitro--modulation by the dietary anthocyanin, cyanidin-3-glycoside. *Eur J Nutr.* 2005 Jun;44(4):195-203.
21. Fukamachi K, Imada T, Ohshima Y, Xu J, Tsuda H. Purple corn color suppresses Ras protein level and inhibits 7,12-dimethylbenz[a]anthracene-induced mammary carcinogenesis in the rat. *Cancer Sci.* 2008 Sep;99(9):1841-6.
22. MacFarlane AJ, Stover PJ. Convergence of genetic, nutritional and inflammatory factors in gastrointestinal cancers. *Nutr Rev.* 2007 Dec;65(12 Pt 2):S157-66.
23. Sakamoto K, Maeda S. Targeting NF-kappaB for colorectal cancer. *Expert Opin Ther Targets.* 2010 Jun;14(6):593-601.
24. Hecht SS, Huang C, Stoner GD, et al. Identification of cyanidin glycosides as constituents of freeze-dried black raspberries which inhibit anti-benzo[a]pyrene-7,8-diol-9,10-epoxide induced NFkappaB and AP-1 activity. *Carcinogenesis.* 2006 Aug;27(8):1617-26.
25. Chen PN, Chu SC, Chiou HL, Kuo WH, Chiang CL, Hsieh YS. Mulberryanthocyanins, cyanidin 3-rutinoside and cyanidin 3-glucoside, exhibited an inhibitory effect on the migration and invasion of a human lung cancer cell line. *Cancer Lett.* 2006 Apr 28;235(2):248-59.
26. Chen PN, Kuo WH, Chiang CL, Chiou HL, Hsieh YS, Chu SC. Black rice anthocyanins inhibit cancer cells invasion via repressions of MMPs and u-PA expression. *Chem Biol Interact.* 2006 Nov 7;163(3):218-29.
27. Chen PN, Chu SC, Chiou HL, Chiang CL, Yang SF, Hsieh YS. Cyanidin 3-glucoside and peonidin 3-glucoside inhibit tumor cell growth and induce apoptosis in vitro and suppress tumor growth in vivo. *Nutr Cancer.* 2005;53(2):232-43.
28. Fimognari C, Berti F, Nusse M, Cantelli Forti G, Hrelia P. In vitro antitumor activity of cyanidin-3-O-beta-glucopyranoside. *Cancer Chemother.* 2005 Oct;51(6):332-5.
29. Yeh CT, Yen GC. Induction of apoptosis by the Anthocyanidins through regulation of Bcl-2 gene and activation of c-Jun N-terminal kinase cascade in hepatoma cells. *J Agric Food Chem.* 2005 Mar 9;53(5):1740-9.
30. Li L, Adams LS, Chen S, Killian C, Ahmed A, Seeram NP. Eugenia jambolana Lam. berry extract inhibits growth and induces apoptosis of human breast cancer but not non-tumorigenic breast cells. *J Agric Food Chem.* 2009 Feb 11;57(3):826-31.
31. Shin DY, Ryu CH, Lee WS, et al. Induction of apoptosis and inhibition of invasion in human hepatoma cells by anthocyanins from meoru. *Ann N Y Acad Sci.* 2009 Aug;1171:137-48.
32. Liu J, Zhang W, Jing H, Popovich DG. Bog bilberry (*Vaccinium uliginosum* L.) extract reduces cultured Hep-G2, Caco-2, and 3T3-L1 cell viability, affects cell cycle progression, and has variable effects on membrane permeability. *J Food Sci.* 2010 Apr;75(3):H103-7.
33. Serafino A, Sinibaldi-Vallebona P, Lazzarino G, et al. Differentiation of human melanoma cells induced by cyanidin-3-O-beta-glucopyranoside. *FASEB J.* 2004 Dec;18(15):1940-2.
34. Xu M, Bower KA, Wang S, et al. Cyanidin-3-Glucoside inhibits ethanol-induced invasion of breast cancer cells overexpressing ErbB2. *Mol Cancer.* 2010 Oct 29;9:285.
35. Zikri NN, Riedl KM, Wang LS, Lechner J, Schwartz SJ, Stoner GD. Black raspberry components inhibit proliferation, induce apoptosis, and modulate gene expression in rat esophageal epithelial cells. *Nutr Cancer.* 2009 Nov;61(6):816-26.
36. Serraino I, Dugo L, Dugo P, et al. Protective effects of cyanidin-3-O-glucoside from blackberry extract against peroxynitrite-induced endothelial dysfunction and vascular failure. *Life Sci.* 2003 Jul 18;73(9):1097-114.
37. Wang J, Mazza G. Inhibitory effects of anthocyanins and other phenolic compounds on nitric oxide production in LPS/IFN-gamma-activated RAW 264.7 macrophages. *J Agric Food Chem.* 2002 Feb 13;50(4):850-7.
38. Xu JW, Ikeda K, Yamori Y. Upregulation of endothelial nitric oxide synthase by cyanidin-3-glucoside, a typical anthocyanin pigment. *Hypertension.* 2004 Aug;44(2):217-22.
39. Valcheva-Kuzmanova S, Kuzmanov K, Mihova V, Krasnaliev I, Borisova P, Belcheva A. Antihyperlipidemic effect of Aronia melanocarpa fruit juice in rats fed a high-cholesterol diet. *Plant Foods Hum Nutr.* 2007 Mar;62(1):19-24.

40. Tsuda T, Horio F, Osawa T. The role of anthocyanins as an antioxidant under oxidative stress in rats. *Biofactors*. 2000;13(1-4):133-9.
41. Xia X, Ling W, Ma J, et al. An anthocyanin-rich extract from black rice enhances atherosclerotic plaque stabilization in apolipoprotein E-deficient mice. *J Nutr*. 2006 Aug;136(8):2220-5.
42. Kwon EK, Lee DY, Lee H, et al. Flavonoids from the buds of Rosa damascena inhibit the activity of 3-hydroxy-3-methylglutaryl-coenzyme a reductase and angiotensin I-converting enzyme. *J Agric Food Chem*. 2010 Jan 27;58(2):882-6.
43. Farag YM, Gaballa MR. Diabesity: an overview of a rising epidemic. *Nephrol Dial Transplant*. 2010 Nov 2.
44. Tsuda T, Horio F, Uchida K, Aoki H, Osawa T. Dietary cyanidin 3-O-beta-D-glucoside-rich purple corn color prevents obesity and ameliorates hyperglycemia in mice. *J Nutr*. 2003 Jul;133(7):2125-30.
45. Tsuda T, Ueno Y, Aoki H, et al. Anthocyanin enhances adipocytokine secretion and adipocyte-specific gene expression in isolated rat adipocytes. *Biochem Biophys Res Commun*. 2004 Mar 26;316(1):149-57.
46. Akkarachiyasit S, Charoenlertkul P, Yibchok-Anun S, Adisakwattana S. Inhibitory activities of cyanidin and its glycosides and synergistic effect with acarbose against intestinal alpha-glucosidase and pancreatic alpha-amylase. *Int J Mol Sci*. 2010;11(9):3387-96.
47. Adisakwattana S, Charoenlertkul P, Yibchok-Anun S. alpha-Glucosidase inhibitory activity of cyanidin-3-galactoside and synergistic effect with acarbose. *J Enzyme Inhib Med Chem*. 2009 Feb;24(1):65-9.
48. Matsui T, Ueda T, Oki T, Sugita K, Terahara N, Matsumoto K. alpha-glucosidase inhibitory action of natural acylated anthocyanins. 2. alpha-glucosidase inhibition by isolated acylated anthocyanins. *J Agric Food Chem*. 2001 Apr;49(4):1952-6.
49. Truong VD, Deighton N, Thompson RT, et al. Characterization of anthocyanins and anthocyanidins in purple-fleshed sweetpotatoes by HPLC-DAD/ESI-MS/MS. *J Agric Food Chem*. 2010 Jan 13;58(1):404-10.
50. Rice-Evans CA, Miller NJ, Bolwell PG, Bramley PM, Pridham JB. The relative antioxidant activities of plant-derived polyphenolic flavonoids. *Free Radic Res*. 1995 Apr;22(4):375-83.
51. Crozier A, Jaganath IB, Clifford MN. Dietary phenolics: chemistry, bioavailability and effects on health. *Nat Prod Rep*. 2009 Aug;26(8):1001-43.
52. Chong MF, Macdonald R, Lovegrove JA. Fruit polyphenols and CVD risk: a review of human intervention studies. *Br J Nutr*. 2010 Oct;104 Suppl 3:S28-39.
53. Del Rio D, Borges G, Crozier A. Berry flavonoids and phenolics: bioavailability and evidence of protective effects. *Br J Nutr*. 2010 Oct;104 Suppl 3:S67-90.
54. Williamson G, Clifford MN. Colonic metabolites of berry polyphenols: the missing link to biological activity? *Br J Nutr*. 2010 Oct;104 Suppl 3:S48-66.
55. Basu A, Rhone M, Lyons TJ. Berries: emerging impact on cardiovascular health. *Nutr Rev*. 2010 Mar;68(3):168-77.
56. Matsumoto H, Nakamura Y, Tachibanaki S, Kawamura S, Hirayama M. Stimulatory effect of cyanidin 3-glycosides on the regeneration of rhodopsin. *J Agric Food Chem*. 2003 Jun 4;51(12):3560-3.
57. Tirupula KC, Balem F, Yanamala N, Klein-Seetharaman J. pH-dependent interaction of rhodopsin with cyanidin-3-glucoside. 2. Functional aspects. *Photochem Photobiol*. 2009 Mar-Apr;85(2):463-70.
58. Yanamala N, Tirupula KC, Balem F, Klein-Seetharaman J. pH-dependent interaction of rhodopsin with cyanidin-3-glucoside. 1. Structural aspects. *Photochem Photobiol*. 2009 Mar-Apr;85(2):454-62.
59. Jang YP, Zhou J, Nakanishi K, Sparrow JR. Anthocyanins protect against A2E photooxidation and membrane permeabilization in retinal pigment epithelial cells. *Photochem Photobiol*. 2005 May-Jun;81(3):529-36.
60. Matsunaga N, Imai S, Inokuchi Y, et al. Bilberry and its main constituents have neuroprotective effects against retinal neuronal damage in vitro and in vivo. *Mol Nutr Food Res*. 2009 Jul;53(7):869-77.
61. Jackson GR, Owsley C, McGwin G, Jr. Aging and dark adaptation. *Vision Res*. 1999 Nov;39(23):3975-82.
62. Baylor DA, Burns ME. Control of rhodopsin activity in vision. *Eye (Lond)*. 1998;12(Pt 3b):521-5.
63. Garriga P, Manosa J. The eye photoreceptor protein rhodopsin. Structural implications for retinal disease. *FEBS Lett*. 2002 Sep 25;528(1-3):17-22.
64. Lamb TD, Pugh EN, Jr. Dark adaptation and the retinoid cycle of vision. *Prog Retin Eye Res*. 2004 May;23(3):307-80.





ULTIMATE eye HYDRATION

Eye support is essential to preventing age-related vision problems.

The older eyes get, the more susceptible they become to an array of debilitating issues that can hamper eyesight and cripple quality of life. With just a few drops of the proper eye lubricant, **eye irritation** stemming from **dryness** or **structural dysfunctions** may be alleviated.

Brite Eyes by Life Extension® provides a powerful dose of two well-established lubricants in every drop, soothing eye discomfort without irritation. **Hydroxymethylcellulose** and **glycerin** are FDA-approved for ophthalmic use and are uniquely preserved with potent **antioxidants** and **anti-glycating** agents.

The **Brite Eyes** formula is buffered in a way to make it **soothing to the eye**. The suggested use of **Brite Eyes III** is to apply 1 to 2 drops in each eye every day.

Each box of **Brite Eyes III** contains two individual vials that provide 5 mL each. The reason for putting **Brite Eyes** into individual vials is to reduce the risk of bacterial contamination. Having small vials also makes it convenient for consumers to keep **Brite Eyes** readily accessible at home, the office, in one's purse or pocket, and other places where access to a soothing eye drop is needed.



ITEM #00893

The retail price for a box containing two 5-mL vials of **Brite Eyes III** is \$34. If a member buys four boxes during **Super Sale**, the price is reduced to **\$21.60 per box**.

**To order Brite Eyes III,
call 1-800-544-4440
or visit www.LifeExtension.com**

C3G is now in your EYE PROTECTION FORMULA



Most Life Extension® members take a supplement containing zeaxanthin, lutein, meso-zeaxanthin, and astaxanthin to protect their vision.

With new findings that **C3G** (*cyanidin-3-glucoside*) can **enhance night vision**, it makes sense to add this unique berry extract to the **Super Zeaxanthin** formula. This enables members to obtain the **optimal amount** of **C3G** without having to swallow another capsule.

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.

Super Zeaxanthin contains a potent dose of **astaxanthin**, a carotenoid found in red algae. Studies show that taking astaxanthin with other carotenoids protects against free radical induced DNA damage, repairs UVA-irradiated cells, and inhibits inflammatory cell infiltration.¹⁻⁴ Astaxanthin also helps support vascular health within the eye and improves visual acuity.³ Its fat-soluble nature offers protection to sensitive cells inside the eye.⁵

Enhanced Night Vision!

Falling down is responsible for 70% of accidental deaths in older people.⁶ Poor lighting conditions are often the culprit.

Fortunately, **C3G** derived from **black currant** supports eyesight in **dark** conditions by promoting the healthy function of delicate structures within the retina that support **night vision**.⁷

Super Zeaxanthin now contains a potent dose of **C3G** to nourish cells throughout the body.

Comprehensive Ocular Protection in One Daily Capsule

The new **Super Zeaxanthin** formula provides natural plant extracts that have been shown to promote healthy eyesight. Just one softgel of **Super Zeaxanthin with Lutein, Meso-Zeaxanthin Plus Astaxanthin and C3G** provides:

OptiLut®, Lutein Plus® and MZ® 38 mg

Marigold (*Tagetes erecta*) Extract (flower)
[free lutein equivalent 10 mg]

Zeaxanthin & Meso-zeaxanthin blend 3.75 mg

(micronized zeaxanthin, OptiLut®, Lutein Plus® and MZ® Marigold Extract)

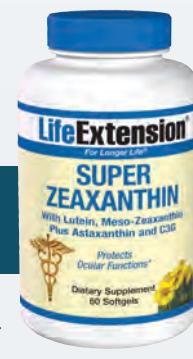
Natural Astaxanthin 6 mg

(Zanthin® CO₂ extract of *Haematococcus pluvialis* algae)

C3G (Cyanidin-3-glucoside) 2.2 mg

[from European black currant (*Ribes nigrum*) extract (fruit)]

The retail price for a bottle containing 60 softgels of **Super Zeaxanthin with Lutein, Meso-zeaxanthin Plus Astaxanthin and C3G** is \$42. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$25.65** per bottle. Contains soybeans.



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

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References

1. *J Photochem Photobiol B*. 2007 Jul 27;88(1):1-10.
2. *J Photochem Photobiol B*. 2006 Dec 1;85(3):205-15.

3. *Ophthalmology*. 2008 Feb;115(2):324-33.e2.

4. *Invest Ophthalmol Vis Sci*. 2008 Apr;49(4):1679-85.

5. *Biochimica et Biophysica Acta*. 2001;1512:251-8.

6. Available at: <http://www.aafp.org/afp/20000401/2159.html>. Accessed August 10, 2010.

7. *Alt Med Rev*. 2000;5(6):553-62.

The Upgraded

LIFE EXTENSION MIX™

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 a potent olive extract that provides the best-documented polyphenol called **hydroxytyrosol** in an amount equivalent to drinking one ounce of virgin olive oil a day.

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-1b**. 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.

Lutein is found in **spinach** and **collard greens** and has been shown to help maintain **eye macula pigment** structure.

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.

315 tablets
Item #01555

490 capsules
Item #01554

14.81 oz powder
Item #01556



9 tablets, 14 capsules, or three scoops of powder provide:

Vegetable-Fruit Complex

Green tea extract (decaf.) (98% polyphenols/45% EGCG)	325 mg
Broccoli sprout concentrate <i>(providing sulforaphane, glucosinolates, D-3T, and PEITC)</i>	525 mg
Olive juice extract (<i>providing hydroxytyrosol, oleuropein</i>)	12.5 mg
Grapeseed extract (Leucoselect®)	25 mg
<i>(95% proanthocyanidins)</i>	
Grape (<i>vitis vinifera</i>) extract (BioVin®)	25 mg
<i>[Std. to 95% proanthocyanidins (23.75mg)]</i>	
Ginger extract (5% gingerols)	200 mg
Luteolin (Pureolin™)	8 mg
Lycopene (tomato extract)	3 mg
Lutein complex (marigold)	33.33 mg
<i>(15 mg lutein/465 mcg trans-zeaxanthin)</i>	
Milk thistle extract (85% silymarin)	100 mg
Bromelain	15 mg
Calcium D-Glucarate	200 mg
Citrus Bioflavonoids	200 mg
<i>[Standardized to 50% Hesperidin (100mg)]</i>	
Acerola extract 4:1	300 mg
Bilberry (36% total anthocyanins)	30 mg
Pomegranate (30% punicalagins) (POMELLA®)	85 mg
Sesame seed lignan extract	10 mg
Berry-fruit blend	200 mg
<i>(blackberry, blueberry, cranberry, elderberry, persimmon, plum, and cherry)</i>	
Wild Blueberry (<i>Vaccinium angustifolium</i>)	150 mg
Std. anthocyanin extract (fruit)	
<i>trans</i> -Pterostilbene (from pure Pterospan™ and SMART™ pterostilbene)	0.5 mg
Cyanidin-3-Glucoside (C3G)	1.25 mg

Water-Soluble Vitamins and Enzymatic Activators

Vitamin C	2000 mg
<i>as: ascorbic acid, calcium, magnesium & niacinamide ascorbates, ascorbyl palmitate, acerola extract</i>	
Natural Folate (from lemon extract)	400 mcg
Biotin	3000 mcg
Trimethylglycine (TMG)	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 (D-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 (hydroxylcobalamin)	252 mcg
Vitamin B12 (ion exchange resin)	96 mcg
PABA (para-aminobenzoic acid)	200 mg

The Most Complete Multivitamin Available Today — Now with C3G!

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,¹⁻³ 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 cyanidin-3-glucoside or C3G, a compound found naturally in black currant that has been shown to promote the healthy function of delicate structures in the retina that help support night vision. The new Life Extension Mix™ now contains natural food-based folate and Crominex® 3+, which helps maintain healthy blood sugar levels in those already within normal range. During **Super Sale**, the full daily dose of Life Extension Mix™ can be obtained for as little as \$1.34 per day.

Fat-Soluble Vitamins

Vitamin A (as 90% Betatene® <i>D. salina</i> natural beta-carotene and 10% acetate)	5000 IU
Vitamin D3 (cholecalciferol)	2000 IU
Ascorbyl palmitate (fat-soluble vitamin C)	250 mg
Vitamin E (natural D-alpha tocopheryl succinate)	400 IU

Amino Acid Complex

N-acetyl-L-cysteine	600 mg
Taurine	200 mg

Mineral Complex

Selenium (from Se-methyl L-selenocysteine)	100 mcg
Selenium (from L-selenomethionine—SelenoPure™)	50 mcg
Selenium (from sodium selenite)	50 mcg
Zinc (monomethionine) (OptiZinc®)	20 mg
Zinc (succinate)	15 mg
Boron (as boron citrate/aspartate/glycinate)	3 mg
Calcium	218 mg
Copper (as copper bisglycinate chelate)	1 mg
Chromium	500 mcg
(as Crominex® 3+ chromium stabilized with Capros® and PrimaVie® Shilajit)	
Potassium chloride (37.4 mg elemental)	71.3 mg
Molybdenum (sodium molybdate)	125 mcg
Manganese (gluconate)	1 mg
Iodine (potassium iodide)	150 mcg
Magnesium oxide (335.96 mg elemental)	560 mg
Magnesium citrate (35.28 mg elemental)	261.3 mg
Magnesium glycinate (11.74 mg elemental)	100 mg
Magnesium taurinate (7.83 mg elemental)	100 mg
Magnesium arginate (5.87 mg elemental)	100 mg
Magnesium ascorbate (3.40 mg elemental)	58.1 mg

Cholinergic Complex

Choline (from bitartrate)	120 mg
Phosphatidylcholine (from soy)	150 mg
Inositol	250 mg

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 development.

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 lifesaving mineral.

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

CAUTION: The high-niacin version of Life Extension Mix 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 500 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 obtain a serum 25-hydroxyvitamin D measurement. Vitamin D supplementation is not recommended for individuals with hypercalcemia (high blood calcium levels).

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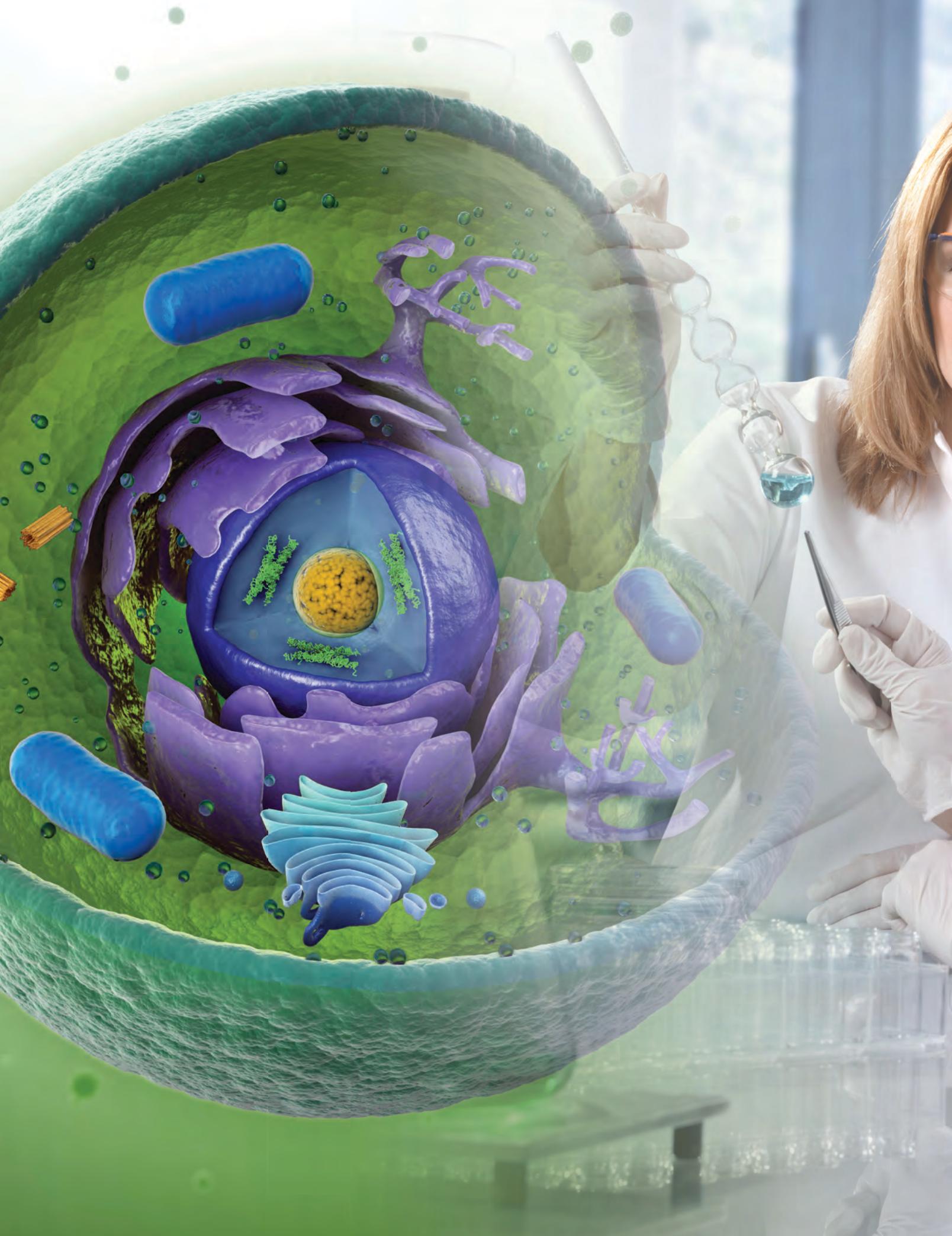
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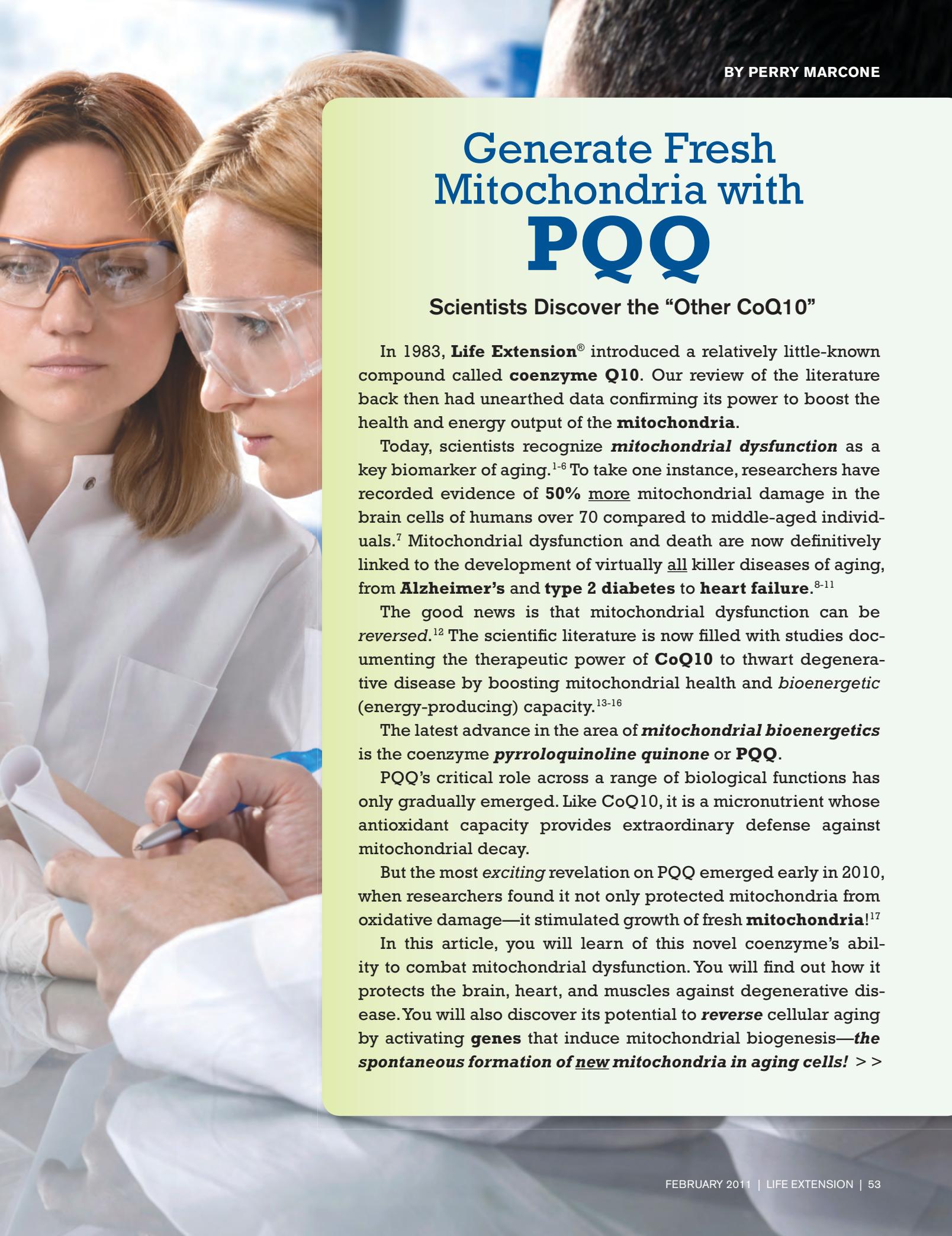
1. Stroke. 2004 Sep;35(9):2014-9.
2. Mutant Res. 1999 Jul 16;428(1-2):329-38.
3. J Am Diet Assoc. 1996 Oct;96(10):1027-39.

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Contains soybeans, corn, rice, and sesame.

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.





Generate Fresh Mitochondria with PQQ

Scientists Discover the “Other CoQ10”

In 1983, **Life Extension®** introduced a relatively little-known compound called **coenzyme Q10**. Our review of the literature back then had unearthed data confirming its power to boost the health and energy output of the **mitochondria**.

Today, scientists recognize **mitochondrial dysfunction** as a key biomarker of aging.¹⁻⁶ To take one instance, researchers have recorded evidence of **50% more** mitochondrial damage in the brain cells of humans over 70 compared to middle-aged individuals.⁷ Mitochondrial dysfunction and death are now definitively linked to the development of virtually **all** killer diseases of aging, from **Alzheimer's** and **type 2 diabetes** to **heart failure**.⁸⁻¹¹

The good news is that mitochondrial dysfunction can be **reversed**.¹² The scientific literature is now filled with studies documenting the therapeutic power of **CoQ10** to thwart degenerative disease by boosting mitochondrial health and **bioenergetic** (energy-producing) capacity.¹³⁻¹⁶

The latest advance in the area of **mitochondrial bioenergetics** is the coenzyme **pyrroloquinoline quinone** or **PQQ**.

PQQ's critical role across a range of biological functions has only gradually emerged. Like CoQ10, it is a micronutrient whose antioxidant capacity provides extraordinary defense against mitochondrial decay.

But the most exciting revelation on PQQ emerged early in 2010, when researchers found it not only protected mitochondria from oxidative damage—it stimulated growth of fresh **mitochondria**!¹⁷

In this article, you will learn of this novel coenzyme's ability to combat mitochondrial dysfunction. You will find out how it protects the brain, heart, and muscles against degenerative disease. You will also discover its potential to **reverse** cellular aging by activating **genes** that induce mitochondrial biogenesis—the **spontaneous formation of new mitochondria in aging cells!** >>



PQQ: A Breakthrough in Cellular Anti-Aging

PQQ is ubiquitous in the natural world. Its presence in *interstellar stardust* has led some experts to hypothesize a pivotal role for PQQ in the evolution of life on Earth.¹⁸ It has been found in all plant species tested to date. Neither humans nor the bacteria that colonize the human digestive tract have demonstrated the ability to synthesize it.¹⁹ This has led researchers to classify PQQ as an **essential micronutrient**.²⁰

PQQ's potential to stimulate **mitochondrial biogenesis** was foreshadowed by repeated early findings indicating its central role in growth and development across multiple forms of life.

It has been shown to be a potent growth factor in plants, bacteria, and higher organisms.^{21,22} Pre-clinical studies reveal that when deprived of dietary PQQ, animals exhibit stunted growth, compromised immunity, impaired reproductive capability, and most importantly, **fewer mitochondria in their tissue**. Rates of conception, the number of offspring, and survival rates in juvenile animals are also significantly reduced in the absence of PQQ.²³⁻²⁵ Introducing PQQ back into the diet reverses these effects, restoring systemic function while simultaneously *increasing* mitochondrial number and energetic efficiency.

Optimal Mitochondrial Defense

As the primary engines of almost all bioenergy production, the mitochondria rank among the physiological structures *most* vulnerable to destruction from *oxidative damage*. PQQ's formidable free radical-scavenging capacity furnishes the mitochondria with superior antioxidant protection.

At the core of this capacity is an extraordinary molecular stability.³⁰ As a bioactive coenzyme, PQQ *actively* participates in the energy transfer within the mitochondria that supplies the body with most of its bioenergy (like **CoQ10**).

Unlike other antioxidant compounds, PQQ's exceptional stability allows it to carry out thousands of these electron transfers *without* undergoing molecular breakdown. It has been proven especially effective in neutralizing the ubiquitous **superoxide** and **hydroxyl** radicals.³¹ According to the most recent research, “PQQ is **30 to 5,000 times** more efficient in sustaining redox cycling (mitochondrial energy production) . . . than other common [antioxidant compounds], e.g. ascorbic acid.”²¹ A consistent finding in the scientific literature is that nutrients like PQQ provide more wide-ranging benefits than conventional antioxidants the general public relies on.

Anti-Aging Armor for the Most Energy-Intensive Organs

PQQ's dual capacity as a *cell signaling modulator* and a superior antioxidant renders it optimally effective in combating degenerative disease and age-related declines in the body's most energetic organs: the **heart** and **brain**.

The revelation of its ability to favorably affect system-wide cell development, metabolism, and mitochondrial biogenesis affords an explanation for a wealth of data on its neuroprotective and cardio-protective benefits.

Neuroprotection

PQQ has been shown to optimize health and function of the entire central nervous system. It *reverses* cognitive impairment caused by chronic oxidative stress in pre-clinical models, improving performance on memory tests.³² It has also been shown to safeguard the "Parkinson's disease gene," DJ-1, from *self-oxidation*—an early step in the onset of disease.³³

Reactive *nitrogen* species (RNS), like reactive oxygen species, impose severe stresses on damaged neurons.³⁴ They arise spontaneously following stroke and spinal cord injuries and have been shown to account for a substantial proportion of subsequent long-term neurological damage. PQQ *suppresses* RNS in experimentally induced strokes.³⁵ It also provides additional protection by blocking gene expression of inducible nitric oxide synthase (iNOS), a major source of RNS, following spinal cord injury.³⁶

PQQ powerfully protects brain cells against oxidative damage following *ischemia-reperfusion injury*—the inflammation and oxidative damage that result from the sudden return of blood and nutrients to tissues deprived of them by stroke.³⁷ Given immediately before induction of stroke in animal models, PQQ significantly reduces the size of the damaged brain area.³⁸

PQQ also interacts in a beneficial manner with our brain's neurotransmitter systems. In particular, PQQ protects neurons by modifying the important NMDA receptor site.^{39,40} NMDA is a powerful mediator of "excitotoxicity," a response to long-term overstimulation of neurons that is associated with many neurodegenerative diseases and seizures.⁴¹⁻⁴³ PQQ also protects against neurotoxicity induced by other toxins, including **mercury**.^{44,45}

A mounting body of evidence points to PQQ as a potent intervention in **Alzheimer's disease** and **Parkinson's disease**. Both are triggered by accumulation of abnormal proteins that initiate a cascade of oxidative events resulting in brain cell death. PQQ prevents development of a protein (alpha-synuclein)

PQQ

- **Mitochondrial dysfunction** has been definitively linked to virtually all killer diseases of aging, from **Alzheimer's disease** and **type 2 diabetes** to **heart failure**.
- Researchers have recorded evidence of greater mitochondrial damage in the brain cells of humans over 70 compared to those in their early 40s.
- Many scientists believe *mitochondrial longevity* determines *overall* longevity.
- A next-generation **coenzyme** is being introduced called *pyrroloquinoline quinone* or **PQQ** that has been shown to induce **mitochondrial biogenesis**—the growth of new mitochondria in aging cells.
- While **CoQ10** optimizes mitochondrial function, PQQ activates genes that govern mitochondrial reproduction, protection, and repair.
- PQQ also affords potent cardioprotection and defense against neuronal (brain) degeneration.
- Published studies show that **20 mg** of PQQ plus **300 mg** of CoQ10 may reverse age-related cognitive decline in aging humans.



Mitochondrial Function and Longevity: The Definitive Link

In cell biology, mitochondria are unique among other cellular components in one vital aspect: they possess their own *primitive DNA*, distinct from the DNA housed within the cell nucleus that you normally think of as the building block of all living organisms.

Mitochondrial DNA closely resembles *bacterial DNA*, the result of an evolutionary legacy.⁵⁵ Biologists believe that at one time our mitochondria existed as separate, highly energetic organisms. Our primordial ancestor cells aggressively engulfed and *incorporated* these “proto-mitochondria” into their own internal structure. This furnished our cellular progenitors with two powerful evolutionary advantages: it harnessed the ability of proto-mitochondria to produce vast quantities of energy from oxygen—and served to boost cellular **longevity**.

This simple fact has *profound* implications for the science of anti-aging.

Why? You already know that cells in your body have the capacity to divide and replicate themselves owing to the presence of nuclear DNA. If mitochondria possess their own DNA, it follows that they should *also* have the ability to replicate themselves and increase their number within a single human cell.

This turns out to be the case: human cells may house anywhere from **2 to 2,500** mitochondria,⁵⁶⁻⁵⁸ depending on tissue type, nutrition, antioxidant status, and other factors. Put differently, one cell may contain over *1,000 times more mitochondria* than another.

The more high-functioning mitochondria in your body, the greater your overall health and longevity. This is no longer a matter of conjecture. A growing number of cell biologists now espouse the theory that mitochondrial number and function *determine human longevity*.⁵⁹⁻⁶¹

The problem is that the scientifically validated methods available to spontaneously increase the number of new mitochondria in our aging bodies are exceedingly difficult. To date, the only known ways to reliably stimulate mitochondrial biogenesis—sustained **calorie restriction** or **strenuous physical activity**—are far too rigorous and impractical for most aging individuals.

A nutrient with the power to safely trigger mitochondrial biogenesis would naturally mark an extraordinary advance in the quest to halt and reverse cellular aging.

PQQ has emerged as that nutrient.

associated with Parkinson’s disease.⁴⁶ It also protects nerve cells from the oxidizing ravages of the amyloid-beta protein linked with Alzheimer’s disease.⁴⁷ A 2010 study revealed that PQQ could prevent formation of amyloid beta molecular structures.⁴⁸

PQQ has also been shown to protect memory and cognition in both aging animals and humans.^{49,50} It stimulates production and release of nerve growth factor in cells that support neurons in the brain.⁵¹ This may partially explain why PQQ supplementation of aging rats resulted in marked improvement of their memory function.⁴⁹

In humans, supplementation with **20 mg per day** of PQQ resulted in improvements on tests of higher cognitive function in a group of middle-aged and elderly people.⁵⁰ These effects were significantly amplified when the subjects also took **300 mg** per day of **CoQ10**.



Why Your Mitochondria Are Highly Exposed to Lethal Mutation

Cell aging occurs as each cell's ability to reproduce itself inexorably declines. This decline is in turn associated with the gradual degradation and destruction of the DNA complex.

Overlooked in this process is the *equally* important role of the mitochondria's robust ability to reproduce as you age.

Just as degradation of the *cellular* DNA complex ultimately leads to senescence and death, degradation of the *mitochondrial* DNA complex leads to the death of the mitochondria *and* the ultimate extinction of the cell—and the “host” organism.

This death spiral of genetic degradation is accelerated in the mitochondria by the very physiological function they must perform. As the nuclear 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. This makes them highly vulnerable to biochemical insults.

There is an additional threat, as scientists have discovered over the past several decades: relative to nuclear DNA, ***mitochondrial DNA possesses few defenses against free radical damage.***^{62,63}

Cellular DNA is protected by numerous “guardian” proteins (histones and repair enzymes) that act to

blunt the impact of free radicals. No such repair systems exist to protect mitochondrial DNA.^{62,63}

Cellular DNA also enjoys superior structural defenses. It 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 attaches *directly* to the inner membrane where the mitochondria's electrochemical furnace rages continuously, generating an enormous volume of toxic reactive oxygen species.

Accordingly, mitochondrial DNA mutates at a much higher rate than cellular DNA.⁶⁴ When you consider that the mitochondria supply at least **95%** of the energy required for all physiological processes in your body, the need to maintain the integrity of mitochondrial DNA takes on even greater urgency. All aging humans should take every step to safeguard the genes that regulate healthy mitochondrial proliferation from lethal mutation. This is supported by an abundance of scientific studies linking genetic *mutation* within the mitochondria to human aging.⁶⁵⁻⁶⁷

PQQ's extraordinary antioxidant capacity represents a powerful new intervention that may effectively reinforce the mitochondria's limited defenses.

Cardioprotection

As with stroke, damage in heart attack is inflicted via ischemia-reperfusion injury. Supplementation with PQQ reduces the size of damaged areas in animal models of acute heart attack (myocardial infarction).⁵² This occurs whether the supplement is given before or after the ischemic event itself.

To further investigate this potential, researchers at the VA Medical Center at UC-San Francisco compared PQQ with ***metoprolol***, a beta blocker that is standard post-MI clinical treatment. Given alone, both treatments reduced the damaged areas' size and protected against heart muscle dysfunction. When they were given together, the left ventricle's pumping pressure was enhanced. The combination also increased mitochondrial energy-producing functions—but the effect was small compared with PQQ alone! And only PQQ favorably reduced lipid peroxidation. The remarkable conclusion: “PQQ is superior to metoprolol in protecting mitochondria from ischemia/reperfusion oxidative damage.”⁵³

Subsequent research from the same team has demonstrated that PQQ helps heart muscle cells resist acute oxidative stress.⁵⁴ The mechanism? *Preserving and enhancing mitochondrial function.*

Summary

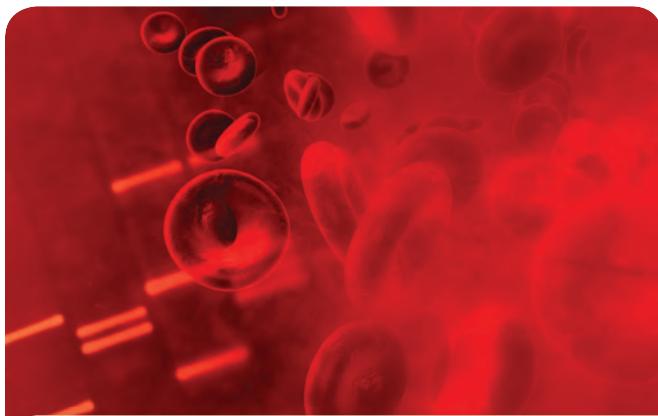
Mitochondrial dysfunction has been definitively linked to virtually ***all*** killer diseases of aging, from ***Alzheimer's disease*** and ***type 2 diabetes*** to ***heart failure***.

Researchers have recorded evidence of greater mitochondrial damage in the brain cells of humans over 70 compared to those in their early 40s. The health and function of these cellular energy generators is now considered so vital that many scientists believe *mitochondrial* longevity determines *overall* longevity in aging humans.

In a revolutionary advance, an essential coenzyme called *pyrroloquinoline quinone* or ***PQQ*** has been

shown to induce ***mitochondrial biogenesis***—the growth of new mitochondria in aging cells!

While **CoQ10** optimizes mitochondrial function, PQQ activates genes that govern mitochondrial reproduction, protection, and repair. PQQ also affords potent cardioprotection and optimal defense against neuronal degeneration. Published studies show that **20 mg** of PQQ plus **300 mg** of CoQ10 may *reverse* age-related cognitive decline in aging humans. ●



PQQ Activates Signaling Molecules

A team of researchers at the University of California decided to analyze PQQ's influence over cell signaling pathways involved in the generation of new mitochondria.¹⁷

Their work, published in 2010, led to several extraordinary discoveries.

They found that PQQ's critical role in growth and development stems from its unique ability to activate **cell signaling pathways** directly involved in cellular energy metabolism, development, and function. Cells undergo **spontaneous mitochondrial biogenesis** through the effects of **three signaling molecules** activated by PQQ:

PQQ activates expression of **PCG-1 α** (peroxisome proliferator-activated receptor gamma coactivator 1-alpha). PCG-1 α is a "master regulator" that mobilizes your cells' response to various external triggers. It directly stimulates genes that enhance mitochondrial and cellular respiration, growth, and reproduction. Its capacity to upregulate cellular metabolism at the genetic level favorably affects **blood pressure, cholesterol** and **triglyceride** breakdown, and the onset of **obesity**.²⁶

PQQ triggers a signaling protein known as **CREB** (cAMP-response element-binding protein). CREB plays a pivotal role in embryonic development and

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

- Bliznakov EG. Aging, mitochondria, and coenzyme Q(10): the neglected relationship. *Biochimie*. 1999 Dec;81(12):1131-2.
- Linnane AW, Marzuki S, Ozawa T, Tanaka M. Mitochondrial DNA mutations as an important contributor to ageing and degenerative diseases. *Lancet*. 1989 Mar 25;1(8639):642-5.
- Lanza IR, Nair KS. Mitochondrial metabolic function assessed in vivo and in vitro. *Curr Opin Clin Nutr Metab Care*. 2010 Sept;13(5):511.
- Mota MP, Peixoto FM, Soares JF, et al. Influence of aerobic fitness on age-related lymphocyte DNA damage in humans: relationship with mitochondria respiratory chain and hydrogen peroxide production. *Age (Dordr)*. 2010 Sept;32(2):337-46.
- Tranah G. Mitochondrial-nuclear epistasis: Implications for human aging and longevity. *Ageing Res Rev*. 2010 Jun 25.
- Cho DH, Nakamura T, Lipton SA. Mitochondrial dynamics in cell death and neurodegeneration. *Cell Mol Life Sci*. 2010 Oct;67(20):3435-47.

growth. It also beneficially interacts with *histones*, molecular compounds shown to protect and repair cellular DNA.²⁷ CREB also stimulates the growth of new mitochondria.

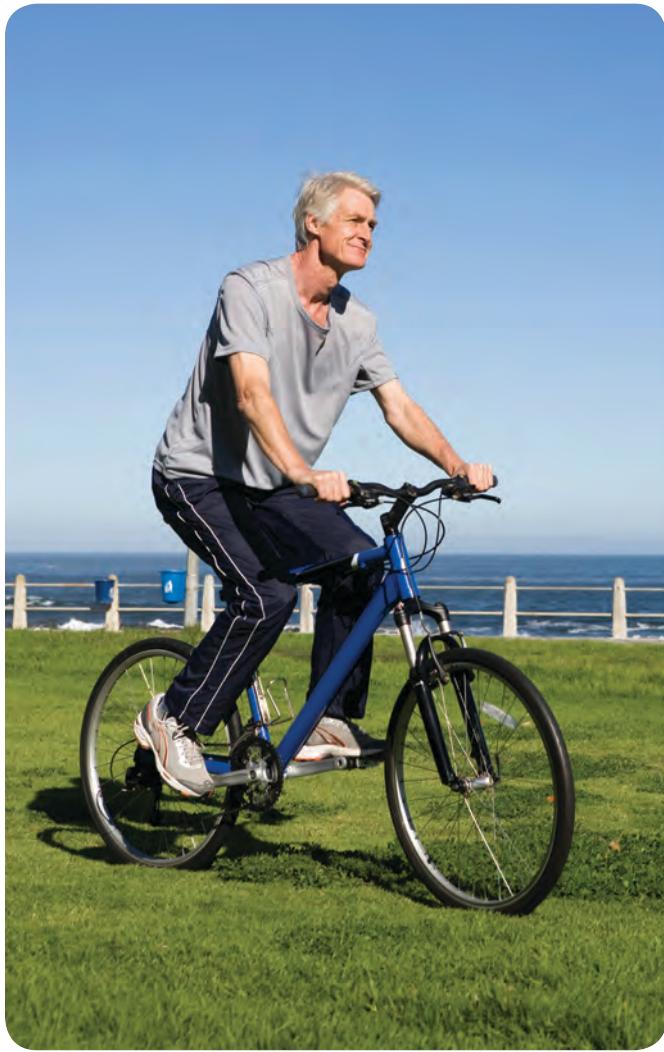
PQQ regulates a recently discovered cell signaling protein called **DJ-1**. As with PCG-1 α and CREB, DJ-1 is intrinsically involved in cell function and survival. It has been shown to **prevent cell death** by combating intensive antioxidant stress^{28,29} and is of particular importance to brain health and function. DJ-1 damage and mutation have been conclusively linked to the onset of **Parkinson's disease** and other neurological disorders.

These findings shed light on the results of prior studies where a PQQ deficiency in juvenile mice, for example, resulted in elevated plasma glucose concentrations, a **20-30%** reduction in the number of mitochondria in the liver, and consequent impairment in oxygen metabolism.²³ These are hallmark indicators of mitochondrial dysfunction. Additional animal models also suggested significant alterations in mitochondrial numbers.²⁵ Taken together, these results confirm PQQ's power to significantly boost mitochondrial number and function—the key to cellular anti-aging and longevity.

7. Mecocci P, MacGarvey U, Kaufman AE, et al. Oxidative damage to mitochondrial DNA shows marked age-dependent increases in human brain. *Ann Neurol.* 1993 Oct;34(4):609-16.
8. Bugger H, Abel ED. Mitochondria in the diabetic heart. *Cardiovasc Res.* 2010 Jul 16.
9. Conley KE, Amara CE, Jubrias SA, Marcinek DJ. Mitochondrial function, fibre types and ageing: new insights from human muscle in vivo. *Exp Physiol.* 2007 Mar;92(2):333-9.
10. Lesnefsky EJ, Moghaddas S, Tandler B, Kerner J, Hoppel CL. Mitochondrial dysfunction in cardiac disease: ischemia—reperfusion, aging, and heart failure. *J Mol Cell Cardiol.* 2001 Jun;33(6):1065-89.
11. Maruszak A, Zekanowski C. Mitochondrial dysfunction and Alzheimer's disease. *Prog Neuropsychopharmacol Biol Psychiatry.* 2010 Jul 15.
12. Conley KE, Marcinek DJ, Villarin J. Mitochondrial dysfunction and age. *Curr Opin Clin Nutr Metab Care.* Nov 2007;10(6):688-692.
13. Bliznakov EG. Aging, mitochondria, and coenzyme Q(10): the neglected relationship. *Biochimie.* 1999 Dec;81(12):1131-2.
14. Ochoa JJ, Quiles JL, Lopez-Frias M, Huertas JR, Mataix J. Effect of lifelong coenzyme Q10 supplementation on age-related oxidative stress and mitochondrial function in liver and skeletal muscle of rats fed on a polyunsaturated fatty acid (PUFA)-rich diet. *J Gerontol A Biol Sci Med Sci.* 2007 Nov;62(11):1211-8.
15. Janson M. Orthomolecular medicine: the therapeutic use of dietary supplements for anti-aging. *Clin Interv Aging.* 2006;1(3):261-5.
16. Linnane AW, Degli Esposti M, Generowicz M, Luff AR, Nagley P. The universality of bioenergetic disease and amelioration with redox therapy. *Biochim Biophys Acta.* 1995 May 24;1271(1):191-4.
17. Chowanadisai W, Bauerly KA, Tchaparian E, Wong A, Cortopassi GA, Rucker RB. Pyrroloquinoline quinone stimulates mitochondrial biogenesis through cAMP response element-binding protein phosphorylation and increased PGC-1alpha expression. *J Biol Chem.* 2010 Jan 1;285(1):142-52.
18. Rucker R, Chowanadisai W, Nakano M. Potential physiological importance of pyrroloquinoline quinone. *Altern Med Rev.* 2009 Sep;14(3):268-77.
19. Smidt CR, Bean-Knudsen D, Kirsch DG, Rucker RB. Does the intestinal microflora synthesize pyrroloquinoline quinone? *Biofactors.* 1991 Jan;3(1):53-9.
20. Zhang Y, Rosenberg PA. The essential nutrient pyrroloquinoline quinone may act as a neuroprotectant by suppressing peroxynitrite formation. *Eur J Neurosci.* 2002 Sep;16(6):1015-24.
21. Stites TE, Mitchell AE, Rucker RB. Physiological importance of quinoenzymes and the O-quinone family of cofactors. *J Nutr.* 2000 Apr;130(4):719-27.
22. Choi O, Kim J, Kim JG, et al. Pyrroloquinoline quinone is a plant growth promotion factor produced by *Pseudomonas fluorescens* B16. *Plant Physiol.* 2008 Feb;146(2):657-68.
23. Stites T, Storms D, Bauerly K, et al. Tchaparian. Pyrroloquinoline quinone modulates mitochondrial quantity and function in mice. *J Nutr.* 2006 Feb;136(2):390-6.
24. Steinberg F, Stites TE, Anderson P, et al. Pyrroloquinoline quinone improves growth and reproductive performance in mice fed chemically defined diets. *Exp Biol Med (Maywood).* 2003 Feb;228(2):160-6.
25. Bauerly KA, Storms DH, Harris CB, et al. Pyrroloquinoline quinone nutritional status alters lysine metabolism and modulates mitochondrial DNA content in the mouse and rat. *Biochim Biophys Acta.* 2006 Nov;1760(11):1741-8.
26. Entrez Gene: PPARGC1A peroxisome proliferator-activated receptor gamma, coactivator 1 alpha [Homo sapiens] GeneID: 10891.
27. Entrez Gene: CREBBP CREB binding protein [Homo sapiens] GeneID: 1387.
28. Mitsumoto A, Nakagawa Y. DJ-1 is an indicator for endogenous reactive oxygen species elicited by endotoxin. *Free Radic Res.* 2001 Dec;35(6):885-93.
29. Taira T, Saito Y, Niki T, Iguchi-Ariga SM, Takahashi K, Ariga H. DJ-1 has a role in antioxidative stress to prevent cell death. *EMBO Rep.* 2004 Feb;5(2):213-8.
30. Paz MA, Martin P, Fluckiger R, Mah J, Gallop PM. The catalysis of redox cycling by pyrroloquinoline quinone (PQQ), PQQ derivatives, and isomers and the specificity of inhibitors. *Anal Biochem.* 1996 Jul 1;238(2):145-9.
31. Urakami T, Yoshida C, Akaike T, Maeda H, Nishigori H, Niki E. Synthesis of monoesters of pyrroloquinoline quinone and imidazopyrroloquinoline, and radical scavenging activities using electron spin resonance in vitro and pharmacological activity in vivo. *J Nutr Sci Vitaminol (Tokyo).* 1997 Feb;43(1):19-33.
32. Ohwada K, Takeda H, Yamazaki M, et al. Pyrroloquinoline quinone (PQQ) prevents cognitive deficit caused by oxidative stress in rats. *J Clin Biochem Nutr.* 2008 Jan;42:29-34.
33. Nunome K, Miyazaki S, Nakano M, Iguchi-Ariga S, Ariga H. Pyrroloquinoline quinone prevents oxidative stress-induced neuronal death probably through changes in oxidative status of DJ-1. *Biol Pharm Bull.* 2008 Jul;31(7):1321-6.
34. Ono K, Suzuki H, Sawada M. Delayed neural damage is induced by iNOS-expressing microglia in a brain injury model. *Neurosci Lett.* 2010 Apr 5;473(2):146-50.
35. Zhang Y, Rosenberg PA. The essential nutrient pyrroloquinoline quinone may act as a neuroprotectant by suppressing peroxynitrite formation. *Eur J Neurosci.* 2002 Sep;16(6):1015-24.
36. Hirakawa A, Shimizu K, Fukumitsu H, Furukawa S. Pyrroloquinoline quinone attenuates iNOS gene expression in the injured spinal cord. *Biochem Biophys Res Commun.* 2009 Jan 9;378(2):308-12.



37. Jensen FE, Gardner GJ, Williams AP, Gallop PM, Aizenman E, Rosenberg PA. The putative essential nutrient pyrroloquinoline quinone is neuroprotective in a rodent model of hypoxic/ischemic brain injury. *Neuroscience*. 1994 Sep;62(2):399-406.
38. Zhang Y, Feustel PJ, Kimelberg HK. Neuroprotection by pyrroloquinoline quinone (PQQ) in reversible middle cerebral artery occlusion in the adult rat. *Brain Res*. 2006 Jun 13;1094(1):200-6.
39. Aizenman E, Hartnett KA, Zhong C, Gallop PM, Rosenberg PA. Interaction of the putative essential nutrient pyrroloquinoline quinone with the N-methyl-D-aspartate receptor redox modulatory site. *J Neurosci*. 1992 Jun;12(6):2362-9.
40. Aizenman E, Jensen FE, Gallop PM, Rosenberg PA, Tang LH. Further evidence that pyrroloquinoline quinone interacts with the N-methyl-D-aspartate receptor redox site in rat cortical neurons in vitro. *Neurosci Lett*. 1994 Feb 28;168(1-2):189-92.
41. Hossain MA. Molecular mediators of hypoxic-ischemic injury and implications for epilepsy in the developing brain. *Epilepsy Behav*. 2005 Sep;7(2):204-13.
42. Dong XX, Wang Y, Qin ZH. Molecular mechanisms of excitotoxicity and their relevance to pathogenesis of neurodegenerative diseases. *Acta Pharmacol Sin*. 2009 Apr;30(4):379-87.
43. Foran E, Trott D. Glutamate transporters and the excitotoxic path to motor neuron degeneration in amyotrophic lateral sclerosis. *Antioxid Redox Signal*. 2009 Jul;11(7):1587-602.
44. Hara H, Hiramatsu H, Adachi T. Pyrroloquinoline quinone is a potent neuroprotective nutrient against 6-hydroxydopamine-induced neurotoxicity. *Neurochem Res*. 2007 Mar;32(3):489-95.
45. Zhang P, Xu Y, Sun J, Li X, Wang L, Jin L. Protection of pyrroloquinoline quinone against methylmercury-induced neurotoxicity via reducing oxidative stress. *Free Radic Res*. 2009 Mar;43(3):224-33.
46. Kobayashi M, Kim J, Kobayashi N, et al. Pyrroloquinoline quinone (PQQ) prevents fibril formation of alpha-synuclein. *Biochem Biophys Res Commun*. 2006 Oct 27;349(3):1139-44.
47. Zhang JJ, Zhang RF, Meng XK. Protective effect of pyrroloquinoline quinone against Abeta-induced neurotoxicity in human neuroblastoma SH-SY5Y cells. *Neurosci Lett*. 2009 Oct 30;464(3):165-9.
48. Kim J, Kobayashi M, Fukuda M, et al. Pyrroloquinoline quinone inhibits the fibrillation of amyloid proteins. *Prion*. 2010 Jan;4(1):26-31.
49. Takatsu H, Owada K, Abe K, Nakano M, Urano S. Effect of vitamin E on learning and memory deficit in aged rats. *J Nutr Sci Vitaminol (Tokyo)*. 2009;55(5):389-93.
50. Nakano M, Ubukata K, Yamamoto T, Yamaguchi H. Effect of pyrroloquinoline quinone (PQQ) on mental status of middle-aged and elderly persons. *FOOD Style 21*. 2009;13(7):50-3.
51. Murase K, Hattori A, Kohno M, Hayashi K. Stimulation of nerve growth factor synthesis/secretion in mouse astroglial cells by coenzymes. *Biochem Mol Biol Int*. 1993 Jul;30(4):615-21.
52. Zhu BQ, Zhou HZ, Teerlink JR, Karliner JS. Pyrroloquinoline quinone (PQQ) decreases myocardial infarct size and improves cardiac function in rat models of ischemia and ischemia/reperfusion. *Cardiovasc Drugs Ther*. 2004 Nov;18(6):421-31.
53. Zhu BQ, Simonis U, Cecchini G, et al. Comparison of pyrroloquinoline quinone and/or metoprolol on myocardial infarct size and mitochondrial damage in a rat model of ischemia/reperfusion injury. *J Cardiovasc Pharmacol Ther*. 2006 Jun;11(2):119-28.
54. Tao R, Karliner JS, Simonis U, et al. Pyrroloquinoline quinone preserves mitochondrial function and prevents oxidative injury in adult rat cardiac myocytes. *Biochem Biophys Res Commun*. 2007 Nov 16;363(2):257-62.
55. Lang BF, Gray MW, Burger G. Mitochondrial genome evolution and the origin of eukaryotes. *Annu Rev Genet*. 1999;33:351-97.
56. Bruce A, Johnson A, Lewis J, Raff M, Roberts K, Walter P. *Molecular Biology of the Cell*. New York, NY: Garland Publishing, Inc.;1994.
57. Voet D, Voet JG, Pratt CW. *Fundamentals of Biochemistry: Life at the Molecular Level*. 2nd ed. New Jersey: John Wiley and Sons, Inc.; 2006:547.
58. Pike RL, Brown M. *Nutrition: An Integrated Approach*. New York, NY: Prentice-Hall; 1984:450-84.
59. Lanza IR, Nair KS. Mitochondrial function as a determinant of life span. *Pflugers Arch*. 2010 Jan;459(2):277-89.
60. Robb EL, Page MM, Stuart JA. Mitochondria, cellular stress resistance, somatic cell depletion and lifespan. *Curr Aging Sci*. 2009 Mar;2(1):12-27.
61. Alexeyev MF, LeDoux SP, Wilson GL. Mitochondrial DNA and aging. *Clin Sci (Lond)*. 2004 Oct;107(4):355-64.
62. Richter C. Oxidative damage to mitochondrial DNA and its relationship to ageing. *Int J Biochem Cell Biol*. 1995 Jul;27(7):647-53.
63. Miquel J. An update on the mitochondrial-DNA mutation hypothesis of cell aging. *Mutat Res*. 1992 Sep;275(3-6):209-16.
64. Wallace DC. Mitochondrial DNA mutations in disease and aging. *Environ Mol Mutagen*. 2010 Jun;51(5):440-50.
65. Wei YH, Lee HC. Oxidative stress, mitochondrial DNA mutation, and impairment of antioxidant enzymes in aging. *Exp Biol Med (Maywood)*. 2002 Oct;227(9):671-82.
66. Lee HC, Wei YH. Oxidative stress, mitochondrial DNA mutation, and apoptosis in aging. *Exp Biol Med (Maywood)*. 2007 May;232(5):592-606.
67. Wei YH, Ma YS, Lee HC, Lee CF, Lu CY. Mitochondrial theory of aging matures—roles of mtDNA mutation and oxidative stress in human aging. *Zhonghua Yi Xue Za Zhi (Taipei)*. 2001 May;64(5):259-70.



NATURAL STRESS RELIEF WITH LEMON BALM AND L-THEANINE

It's hard to find a natural antidote to today's overstressed world. The encouraging news is that **lemon balm** (*Melissa officinalis*), a plant native to the Mediterranean region, has been **clinically proven** to help with **anxiety** and **sleeplessness**. What's more, lemon balm produces these calming effects while also enhancing memory and attention!¹

Cyracos® lemon balm extract is prepared from special lemon balm chosen for its high concentrations of *hydroxycinnamic* and *rosmarinic acids*. These active lemon balm constituents appear to enhance mood by modulating specific nicotinic and muscarinic receptors in the cerebral cortex of the brain.

Aside from relieving everyday stress and sleep problems, the anxiety-relieving properties of this plant extract may also offer smokers relief from the mental stress of quitting, aid in leveling mood swings, and help reduce the emotional hunger associated with dieting (or calorie restriction).

RELAXATION-PROMOTING EFFECTS OF L-THEANINE

The Japanese have long known that *L-theanine*, an amino acid derived from green tea, is a natural relaxant that diminishes stress²—without drowsiness, impaired thought, or other side effects.

L-theanine produces calming effects in the brain in ways that have been compared to meditation, massage, and aromatherapy. *L-theanine* induces relaxation without causing drowsiness. In fact, studies show that **L-theanine enhances the brain's ability to concentrate, learn, and remember**. Unlike caffeine, *L-theanine* increases GABA (gamma-aminobutyric acid), an inhibitory neurotransmitter that not only induces relaxation but also produces a sense of well-being. *L-theanine* may normalize levels of dopamine, a critical brain hormone that is depleted by various stress factors.

A HOST OF HEALTH-ENHANCING BENEFITS

Research shows that *L-theanine* has numerous health-enhancing effects, including protecting cognitive function.* In studies of neurons in cell culture, *L-theanine* significantly reversed glutamate-induced toxicity, a major cause of normal brain aging.³

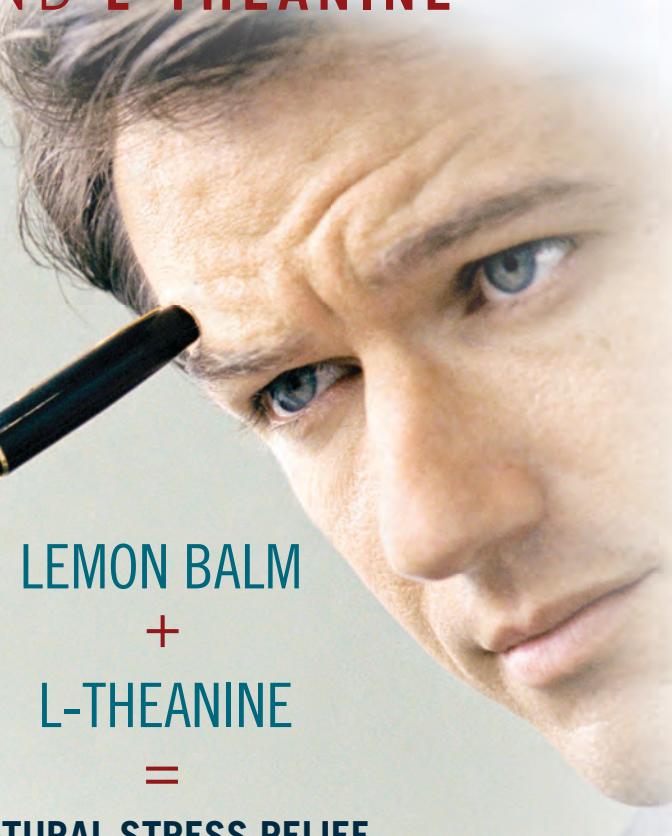
To order Natural Stress Relief
with Lemon Balm and L-Theanine,
call 1-800-544-4440 or visit
www.LifeExtension.com

ITEM #00987



References:

1. *Neuropharmacology*. 2003 Oct;28(10):1871-81.
2. *J Herb Pharmacother*. 2006;6(2):21-30.
3. *Biochem Biophys Res Commun*. 2004 Jul 16;320(1):116-22.



LEMON BALM
+
L-THEANINE
=

NATURAL STRESS RELIEF

Based on an enormous amount of published data showing the multiple beneficial effects of lemon balm extract and *L-theanine*, Life Extension® has combined these potent, but safe nutrients into a proprietary formula called **Natural Stress Relief**. Each 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 during **Super Sale**, the price of this potent stress-relieving formula is reduced to just **\$16.20** 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," which 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.

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.

Restore
Cellular
Energy
with...

NEXT GENERATION CoQ10

Since Life Extension® introduced CoQ10 in 1983, our scientists have continued to develop increased potency and absorability.

Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ contains PrimaVie® shilajit which doubles levels of CoQ10 in the mitochondria.¹

Combining CoQ10 and shilajit produced a **56%** increase in cellular energy production in the **brain** and in muscle there was a **144%** increase in cellular energy production.²

Shilajit boosts CoQ10's beneficial effects by stabilizing CoQ10 in the superior ubiquinol form which *prolongs* its action at the cellular level.^{3,4} Additionally, shilajit facilitates the more efficient *delivery* of CoQ10 into the mitochondria which results in enhanced cellular energy.⁵⁻⁹

Shilajit helps the mitochondria convert fats and sugars into the body's main source of energy, ATP (adenosine triphosphate).⁵⁻⁹

Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™

Combining ubiquinol CoQ10 with **shilajit** generates a powerful synergy that supports more youthful cellular energy production than CoQ10 alone.^{2,4,5}

References:

1. Systemic CoQ level in animals: Part II. Unpublished study. Natreon, Inc.; 2007.
2. *Pharmacologyonline*. 2009;1:817-25.
3. *Pharmacologyonline*. 2009;2:690-8.
4. *Electronic Journal of Biotechnology*. 2008 Jul 15;11(3).
5. Ghosal S. *Shilajit in Perspective*. Alpha Science International Limited; 2006.
6. *Sci Total Environ*. 1987 Apr;62:347-54.
7. *Environ Sci Technol*. 2002 Jul 15;36(14):3170-5.
8. *Environ Sci Technol*. 2002 May 1;36(9):1939-46.
9. *Environ Sci Technol*. 2009 Feb 1;43(3):878-83.

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Item #01426



The retail price for 60 100-mg softgels of **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** is \$62. If a member buys four bottles during **Super Sale**, the price is reduced to **\$37.80** per bottle. Item #01426

Item #01425



The retail price for 100 50-mg softgels of **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** is \$58. If a member buys four bottles during **Super Sale**, the price is reduced to **\$35.78** per bottle. Item #01425

Item #01431



The retail price for 30 200-mg softgels of **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** is \$62. If a member buys four bottles during **Super Sale**, the price is reduced to **\$37.80** per bottle. Item #01431

To order Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™
call 1-800-544-4440 or visit www.LifeExtension.com

FIGHT BACK AGAINST AGING!

Aging is Characterized by Inflammation, Glycation, and Mitochondrial Decay

The loss of cellular vitality is caused by a number of factors, including mitochondrial problems, glycation, and free-radical reactions. Life Extension® members have access to a state-of-the-art nutritional formula called MITOCHONDRIAL ENERGY OPTIMIZER that helps protect delicate cellular structures and enables cells to perform life-sustaining metabolic processes.

MITOCHONDRIAL ENERGY OPTIMIZER 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 (Advanced Glycation End-Products or "AGEs") 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.¹⁻⁵
- **PQQ** This breakthrough micronutrient has recently been shown to trigger **mitochondrial biogenesis**—the growth of **new mitochondria** in aging cells!¹⁶ PQQ also activates genes involved in protecting the delicate structures within the mitochondria.⁷⁻¹⁰
- **LUTEOLIN** Systemic inflammation is involved in most undesirable consequences of aging. Culprits behind **chronic inflammatory** reactions are pro-inflammatory **cytokines**, such as **interleukin-1** and **tumor necrosis factor alpha**. **Luteolin** is a super-potent plant extract that has been shown to modulate these dangerous inflammatory cytokines.¹¹⁻¹⁶
- **BENFOTIAMINE** Effectively modulates multiple destructive biochemical pathways, including AGEs' formation pathway, which 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.¹⁶⁻¹⁹ Benfotiamine protects endothelial cell integrity from the effects of high glucose levels. In addition, benfotiamine exhibits direct antioxidative capacity and prevents induction of DNA damage.²⁰
- **PYRIDOXAL 5'-PHOSPHATE** 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.²¹⁻²⁴

- **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.²⁵⁻²⁸
- **ACETYL-L-CARNITINE ARGINATE** The amino acid L-carnitine is required to transport fats into the **mitochondria** to be burned for cellular energy. **Acetyl-L-carnitine arginate** is a patented form of carnitine that also **supports neurites** in the brain.²⁹

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

A bottle of **Mitochondrial Energy Optimizer** containing **120 capsules** retails for \$94. If a member buys four bottles, during **Super Sale**, the price is reduced to **\$56.70** per bottle. Contains soybeans.

Just four capsules of the
Mitochondrial Energy Optimizer provide:

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



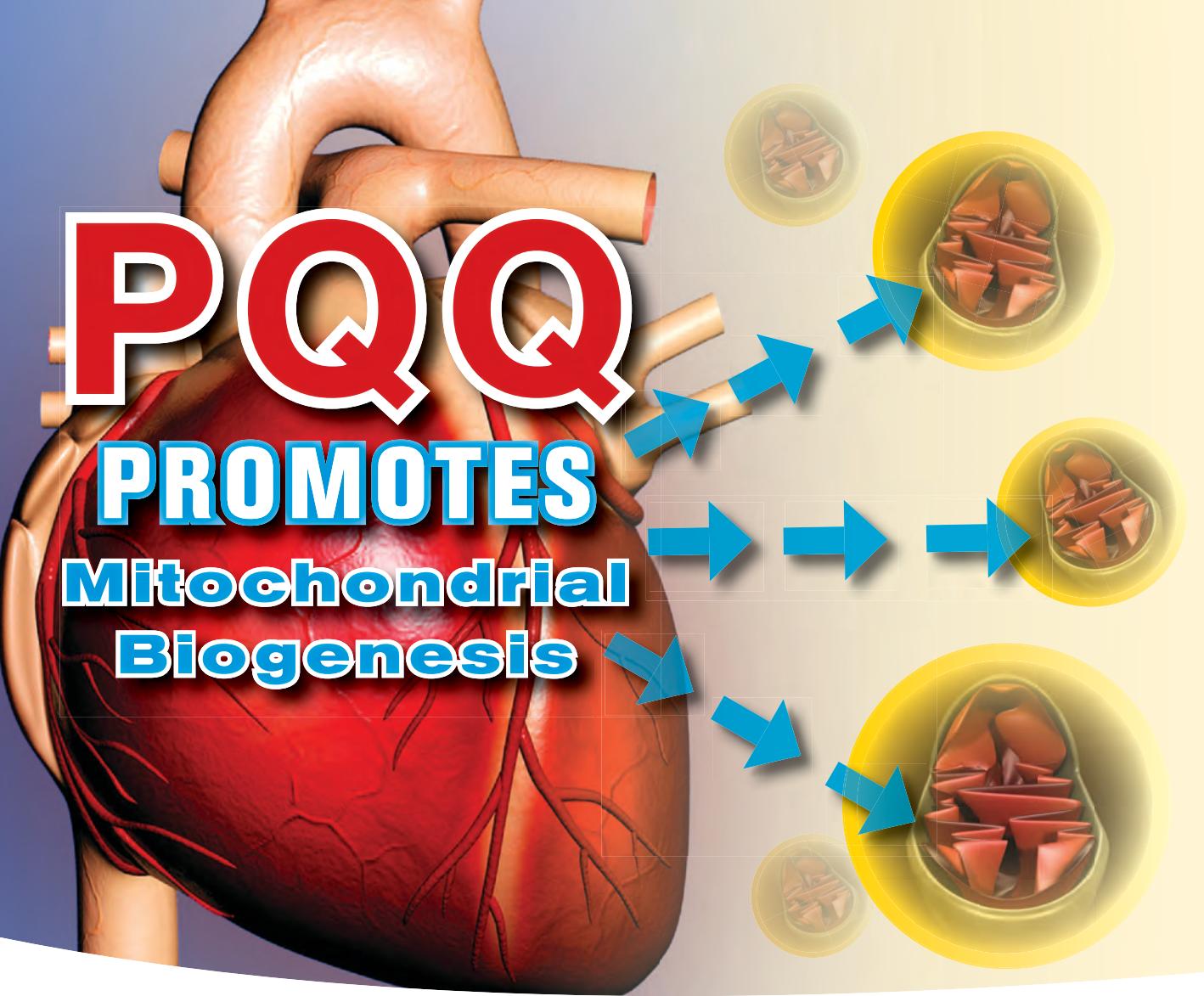
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References:

1. Hormones (Athens). 2008 Apr-Jun;7(2):123-32.
2. Protein Pept Lett. 2008;15(4):385-91.
3. J Alzheimer Dis. 2007 May;11(2):229-40.
4. Ann N Y Acad Sci. 2006 May;1067:69-74.
5. Sci Aging Knowledge Environ. 2005 May 4;2005(18):pe12.
6. J Biol Chem. 2010 Jan;285:142-52.
7. Alt Med Rev. 2009; 14(3):268-77.
8. Entrez Gene: PARGC1A peroxisome proliferator-activated receptor gamma, coactivator 1 alpha [Homo sapiens] GeneID: 10891.
9. Entrez Gene: CREBBP CREB binding protein [Homo sapiens] GeneID: 1387.
10. Hum Mol Genet. 2008 Nov 1;17(21):3357-67.
11. Life Sci. 2007 Nov 30;81(23-7/24):1602-14.
12. J Nutr. 2006 Jun;136(6):1517-21.
13. Biochem Pharmacol. 2005 Jan;69(2):241-8.
14. Immunology. 2005 Jul;115(3):375-87.
15. Am J Respir Crit Care Med. 2002 Mar 15;165(6):818-23.
16. Eur J Pharmacol. 2006 Jul 10;541(1-2):95-105.
17. Nat Med. 2003 Mar;9(3):294-9.
18. Acta Diabetol. 2001;38(3):135-8.
19. Diabetes. 2006 Aug;55(8):2331-7.
20. Diabetes Metab Res Rev. 2008 Jul-Aug;24(5):371-7.
21. J Lipid Res. 2006 May;47(5):964-74.
22. Biochem Biophys Acta. 2001 Feb 14;1535(2):110-9.
23. J Am Soc Nephrol. 2005 Jan; 16(1):144-50.
24. Life Sci. 1988;43(21):1725-31.
25. Biochem Biophys Res Commun. 1996 Apr 16;221(2):422-9.
26. FASEB J. 1999 Feb;13(2):411-8.
27. Antioxid Redox Signal. 2000 Fall;2(3):473-83.
28. Biochem Mol Biol Int. 1995 Oct;37(2):361-70.
29. Neurochem Res. 1995 Jan;20(1):3-9.

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



PQQ PROMOTES Mitochondrial Biogenesis

Critical Importance of Mitochondria

Back in the early 1980s, **Life Extension®** was the first to introduce **CoQ10** as a proven method to enhance **mitochondrial** energy production.

CoQ10 has since gained universal scientific recognition for its role in supporting cellular performance throughout the body.¹⁻⁶

Today, a major advance in combating cellular aging called **PQQ** (*pyrroloquinoline quinone*) is being launched. In an unprecedented breakthrough, researchers have discovered that **PQQ** supports **mitochondrial biogenesis**—the spontaneous growth of **new mitochondria** in aging cells!⁷

Mitochondria are the 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.⁸⁻¹⁴ 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.

The Ultimate Cell Rejuvenator

The enormous amount of energy generated within the mitochondria exposes them to constant free radical attack. The resulting **mitochondrial decay** is a hallmark of aging.

PQQ protects and augments delicate mitochondrial structures to promote *youthful* cellular function in **three** distinct ways:

- **Antioxidant power.** Like CoQ10, **PQQ** is a highly potent antioxidant. Its extraordinary molecular stability enables it to facilitate thousands of biochemical reactions in the mitochondria without breaking down, for maximum antioxidant and bioenergetic support.¹⁵
- **Favorably modulates gene expression.** PQQ activates *genes* that promote formation of new mitochondria⁷—and beneficially interacts with genes directly involved in mitochondrial health. These same genes also support **healthy body weight**, normal **fat** and **sugar metabolism**, and **youthful cellular proliferation**.¹⁶
- **Mitochondrial defense.** Mitochondria possess their own DNA, distinct from the DNA contained in the nucleus. Unfortunately, compared to nuclear DNA, mitochondrial DNA is relatively unprotected. PQQ's antioxidant potency and favorable gene expression profile act to support mitochondrial defense.

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.^{17,18} 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.¹⁹

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.²⁰

References

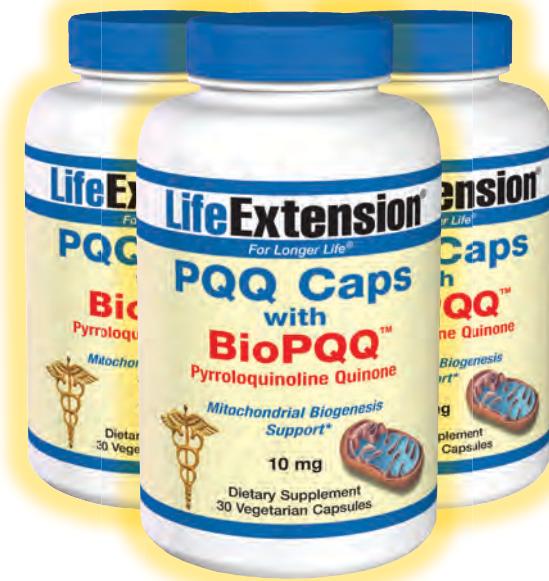
1. *Mitochondrion*. 2007 Jun;7 Suppl:S103-11.
2. *Mech Ageing Dev*. 1978 Mar;7(3):189-97.
3. *Arch Biochem Biophys*. 1992 Jun;295(2):230-4.
4. *Lipids*. 1989 Jul;24(7):579-84.
5. *Biogerontology*. 2002;3(1-2):37-40.
6. *Exp Gerontol*. 2004 Feb;39(2):189-94.
7. *J Biol Chem*. 2010 Jan 1;285:142-52.
8. *Biochimie*. 1999 Dec;81(12):1131-2.
9. *Lancet*. 1989 Mar 25;1(8639):642-5.
10. *Curr Opin Clin Nutr Metab Care*. 2010 Jul 7.
11. *Age (Dordr)*. 2010 Mar 20.
12. *Ageing Res Rev*. 2010 Jun 25.
13. *Cell Mol Life Sci*. 2010 Jun 25.
14. *Zhonghua Yi Xue Za Zhi (Taipei)*. 2001 May;64(5):259-70.
15. *J Nutr*. 2000 Apr;130(4):719-27.
16. Entrez Gene: PARGC1A peroxisome proliferator-activated receptor gamma, coactivator 1 alpha [Homo sapiens] GenID: 10891.
17. *Cardiovasc Drugs Ther*. 2004 Nov;18(6):421-31.
18. *J Cardiovasc Pharmacol Ther*. 2006 Jun;11(2):119-28.
19. *Biochem Biophys Res Commun*. 2007 Nov 16;363(2):257-62.
20. *FOOD Style*. 2009;21:13(7)50-3. [Tokyo].

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 natural fermentation process. The result is the highest quality PQQ available on the market today called **BioPQQ™**.

A bottle containing **30 10 mg** vegetarian capsules of **PQQ Caps with BioPQQ™** retails for \$24. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$14.85** per bottle.

A 10 mg dose of **PQQ** has also been added to the **Mitochondrial Energy Optimizer** and new **Mitochondrial Basics** formulas. Contains rice.

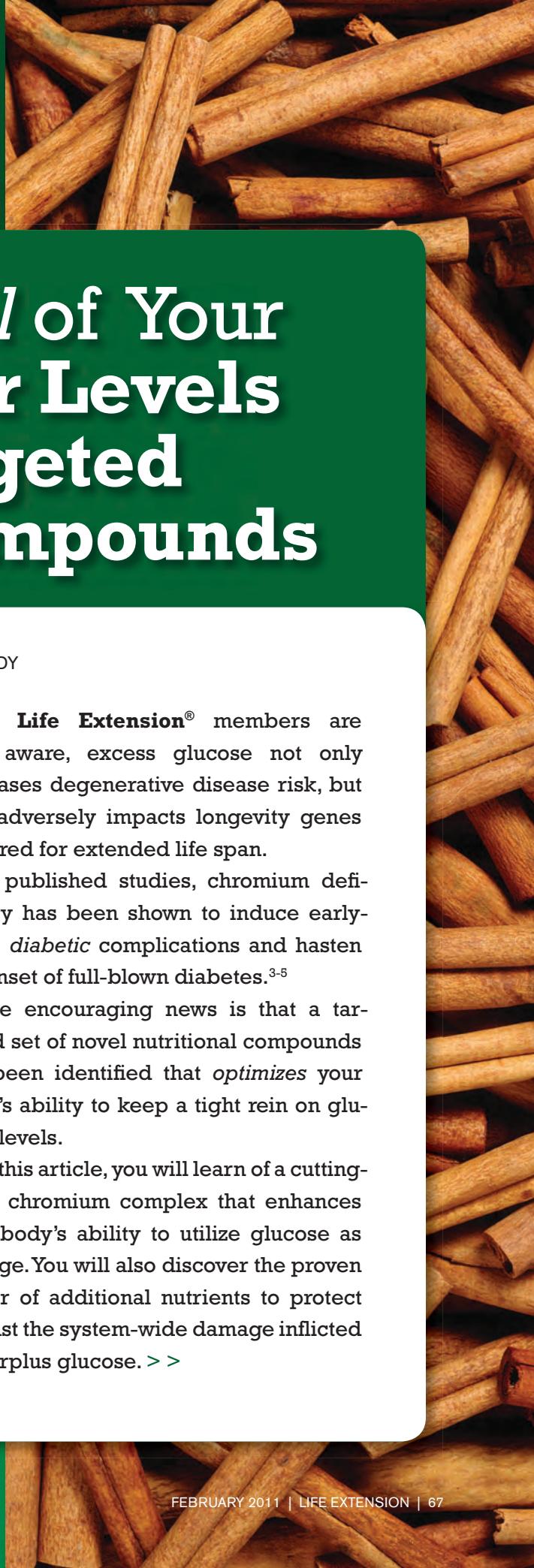


Item #01500

To order new
PQQ Caps with BioPQQ™
standalone or any other
PQQ-containing formula
call 1-800-544-4440 or visit
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Take Control of Your Blood Sugar Levels With Targeted Nutrient Compounds

BY ALONZO BRODY

Over fifty years ago scientists conclusively established that low levels of **chromium** directly contribute to high blood sugar and pre-diabetic complications.¹

Yet today, anywhere between 25-50% of the American population suffers from chromium deficiency.² This is likely the result of modern commercial farming methods that have depleted the soil of valuable chromium and industrial food processing that depletes natural chromium from whole foods. Compounding the danger is the reality that your body's capacity to **absorb** chromium declines with age.

These alarming facts highlight a widespread, stealth threat that rampant nutritional *insufficiencies* may be undermining even the best efforts to optimize blood glucose levels.

As Life Extension® members are well aware, excess glucose not only increases degenerative disease risk, but also adversely impacts longevity genes required for extended life span.

In published studies, chromium deficiency has been shown to induce early-stage *diabetic complications* and hasten the onset of full-blown diabetes.³⁻⁵

The encouraging news is that a targeted set of novel nutritional compounds has been identified that *optimizes* your body's ability to keep a tight rein on glucose levels.

In this article, you will learn of a cutting-edge chromium complex that enhances your body's ability to utilize glucose as you age. You will also discover the proven power of additional nutrients to protect against the system-wide damage inflicted by surplus glucose. >>

Chromium: The Master Blood Sugar Regulator

Studies on chromium have *consistently* demonstrated improvement in blood sugar levels, insulin sensitivity, and lipid profiles.⁶⁻⁹ More recent research reveals how it works: chromium favorably modulates your cells' internal communication centers (*intracellular signaling systems*) to effectively lower blood glucose.

Every cell in your body uses an *internal* communications system that must function properly in order to establish and maintain optimal blood glucose absorption and metabolism. Such intracellular signaling is especially critical to cells' ability to detect and respond to *elevated glucose levels* in the blood.

When cells detect these elevations, an array of biomolecular processes is set in motion that will determine *how well* they will manage the increased sugar burden. Chromium is now recognized to be vital to this process, enabling cellular uptake and breakdown of blood sugar—and effectively lowering glucose levels in the blood.^{10,11}

The clinical literature is rich with data supporting chromium's singular ability to lower blood sugar levels and increase insulin sensitivity.

In a 2009 study, diabetic patients given chromium experienced reductions in their total insulin requirements, along with reductions in fasting and afternoon glucose levels.¹² Recent studies show that supplementation with chromium and biotin can improve glyce-

mic control in overweight to obese diabetic patients when taken along with their regular medication.¹³

Chromium also exerts its positive effects on blood sugar *selectively*—which means it does not induce dangerously low blood sugar levels like some drugs, but rather kicks into gear only when blood sugar levels become too high.^{14,15}

Scientists recognize that control of blood sugar in the immediate period following a meal (the post-prandial period) is perhaps more important than at any other time. This is the interval when blood sugar can dangerously spike in the body, inflicting low-level, cumulative damage to multiple physiological systems over time. Chromium has been shown to dramatically *reduce* total exposure to glucose during the postprandial period in most subjects.¹⁶

Chromium's multitargeted actions not only keep sugar levels low, they *also* prevent the formation of advanced glycation end products, or AGEs.^{5,12,17,18} Most notably, chromium helps bring down levels of ***hemoglobin A1c***, the **advanced glycation end product** associated with long-term exposure to elevated sugar concentrations.¹⁸

These benefits are accompanied by healthy reductions in abnormal lipid levels and increases in **artery-cleansing high-density lipoprotein (HDL)** in the blood.⁹ The combination of chromium and biotin has also been shown to favorably affect a biomarker called the ***atherogenic index***: the ratio of triglycerides to HDL that is associated with increased cardiovascular risk.¹⁹

How Chromium Lowers Blood Sugar Levels: GLUT4

Chromium, like most metals in our bodies, binds to a specific protein "carrier" molecule. Just as the hemoglobin molecule in red blood cells binds to iron, the ***chromodulin*** molecule binds to chromium ions.²¹

In the presence of insulin, the chromodulin molecule changes shape and location in the cell, triggering activation of a vital glucose transporter molecule called GLUT4.^{22,23} GLUT4 is found most abundantly in skeletal muscle and fat tissue, where most glucose metabolism takes place in the body.^{24,25}

Once activated by chromium, GLUT4 shifts its location from deep within the cell's internal matrix to a position on the cell membrane.^{22,26} GLUT4 then allows glucose to flow from *high* concentrations in the blood to lower concentrations in the cell, allowing the cell to safely metabolize sugar while lowering sugar levels in the blood at the same time.

One of the earliest events in the onset of type 2 diabetes is now known to be inhibition of glucose transport by the GLUT4 complex—so scientists are keenly interested in novel approaches to reactivating GLUT4's ability to transport glucose effectively.²⁷⁻²⁹

Chromium directly increases production of GLUT4 transporter molecules themselves, adding a second important mechanism of action that is independent of insulin (a vital effect in insulin-resistant tissue). Chromium regulates the genes for several intracellular signaling molecules, including GLUT4.^{22,30,31} That effect increases the amount of GLUT4 available for moving glucose out of circulation. Exciting recent studies reveal that chromium also activates an entirely different signaling system called p38 MAPK that contributes to increased glucose uptake independent of the GLUT4 system.³²

The improvement in insulin signaling by chromium is also associated with decreased production of specific pro-inflammatory cytokines. These cell-signaling molecules play a mutually reinforcing role in prolonging and worsening impaired glucose control.^{11,20}

Potent Organic Blood Sugar Stabilizers: *Amla* and *Shilajit*

Chromium is a highly reactive metal ion, requiring balance through additional organic materials in order to stabilize and enhance its effects. Two traditional remedies for obesity and its consequences have more recently been shown to synergistically enhance chromium's beneficial action.

The herb *amla* (Indian gooseberry) directly impacts a host of biochemical and gene-regulating processes that positively influence factors related to high blood sugar and metabolic syndrome. Traditional preparations containing amla have long been known to lower blood sugar in diabetic animals and humans, but until recently the mechanisms were unclear.^{33,34}

We now know that amla extracts are powerful antioxidants.^{35,36} They inhibit digestive enzymes that would otherwise convert starch to sugar, helping to reduce blood sugar loads following a meal.³⁵ In pre-clinical models, an herbal combination containing amla reduces lipid peroxidation, the free radical damage to cell membranes that plays a critical role in **atherosclerosis** and the development of **insulin resistance**.³⁷

Amla extract also shields tissues from damage inflicted by excess glucose at multiple levels and it prevents production of sugar alcohols that wreak havoc on the vulnerable ocular (eye) structures and other tissues in diabetics.^{38,39} Amla extracts are showing additional promise in preventing the metabolic syndrome in animal models.⁴⁰

Additional balance is provided by *shilajit*, a complex mixture of organic and inorganic compounds rich in **fulvic acid**. Studies have shown that shilajit has remarkable effects on the ways in which our mitochondria utilize energy from sugar and fats.⁴¹

Fulvic acid acts as a molecular "chaperone," shuttling electrons efficiently along their pathways within mitochondria.⁴²⁻⁴⁴ This enhances the efficiency of mitochondrial respiration and speeds blood sugar metabolism.⁴⁵

The compound of **chromium** plus **amla** and **shilajit** thus acts to optimize the way your body takes up and distributes glucose between and within cells, assuring rapid removal of glucose from the bloodstream and efficient utilization of glucose within cells.

Nutritionally Targeted Glucose Control

- Up to **50%** of the American population is deficient in chromium, one of the principal nutrients the body needs to control blood sugar levels.
- A novel chromium complex has been identified that optimizes your body's ability to break down and convert blood sugar into energy *at the cellular level*.
- The organic compounds *amla* (Indian gooseberry) and *shilajit* work synergistically to enhance chromium's glucose-lowering effects.
- Amla shields cells from damage inflicted by high blood sugar, while shilajit boosts efficient cellular metabolism of glucose.
- Cinnamon polyphenols activate cells' glucose detection systems, enabling them to act more quickly to counter high blood sugar.
- Cinnamon also induces the feeling of being full (satiety) to prevent overconsumption and the after-meal spikes in blood sugar and insulin that result.
- Extracts of brown seaweed help prevent glucose elevations by blocking digestive enzymes and limiting glucose absorption from the intestine.



Indian Gooseberry

Blocking Carbohydrate Breakdown with Seaweed Extracts

A complementary strategy in the battle against elevated glucose is to limit the amount of glucose the body has to process. Many doctors counsel their patients to reduce their total carbohydrate intake, but this strategy provides only *partial* protection for most people. Another approach is to blunt the conversion of starches into their component sugars in the gastrointestinal tract. This can be accomplished safely and effectively by introducing natural **enzyme inhibitors** that halt carbohydrate metabolism in the gut. The most attractive targets are the sugar-producing ***alpha-amylase*** and ***alpha-glucosidase*** enzymes.

Extracts from a variety of seaweeds have inhibitory effects on these enzymes.⁴⁶⁻⁴⁹ Animal studies have revealed that inhibiting these enzymes lowers blood sugar levels.^{50,51} Not only are the polyphenols found in these seaweeds powerful tools in reducing elevated glucose, they are also potent antioxidants.^{52,53}

These seaweed extracts stimulate differentiation of fat cells, preventing them from replicating and reducing the release of harmful fat-related cytokines.^{54,55} They achieve this effect in part through their upregulation of the important PPAR metabolic sensing system and also through increased expression of the GLUT4 glucose transporter.^{54,55}

Cinnamon: A Clinically Documented Glucose Fighter

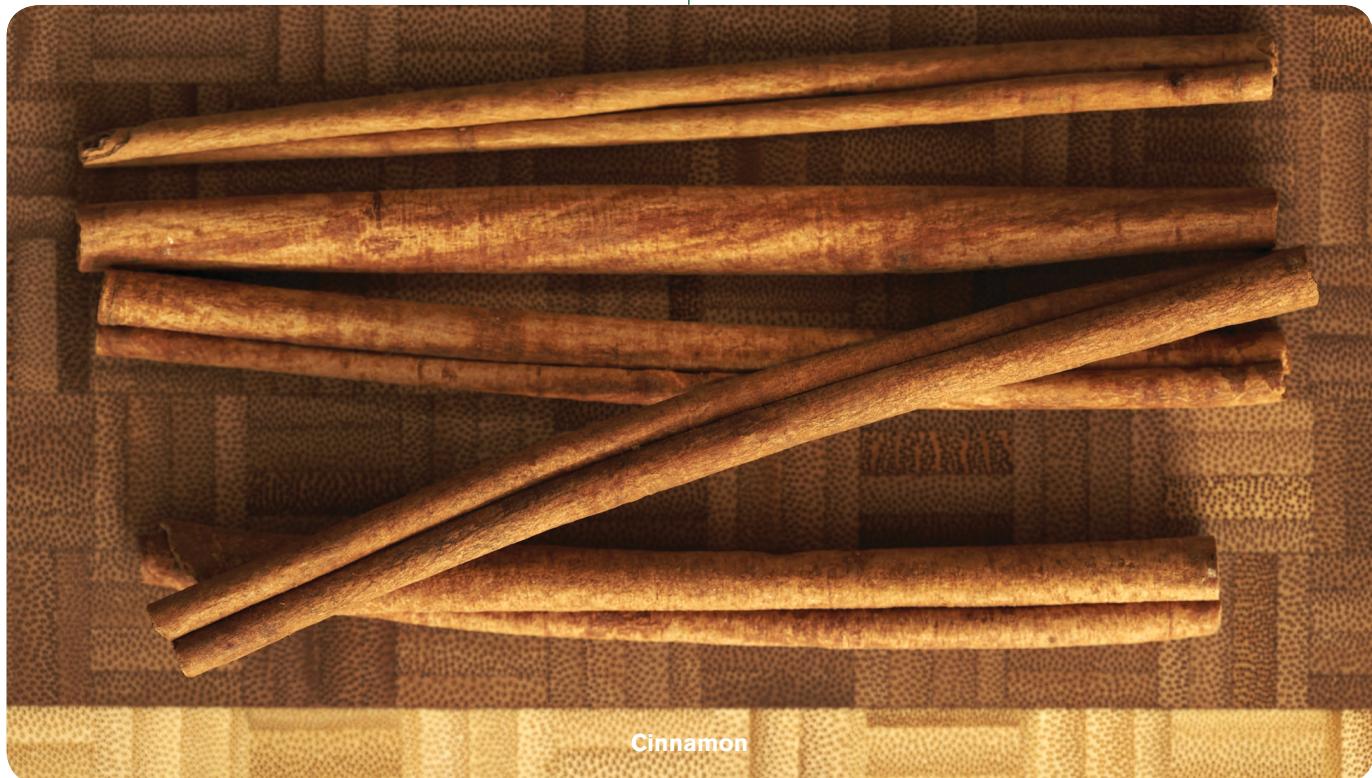
Cinnamon's traditional uses have been related to obesity and to the conditions we now recognize as diabetes and the metabolic syndrome. The polyphenols in *water-soluble cinnamon* extracts act on multiple targets to enhance insulin sensitivity, lower blood sugar, and limit damage by advanced glycation end products.^{56,57} Collectively, these effects contribute to reduction in the risks for the metabolic syndrome.⁵⁸

Cinnamon polyphenols are powerful antioxidants that exert direct protective effects on cells and tissues.⁵⁹ In recent years, we've learned that cinnamon also potently increases the number and activity of glucose transport complexes that enable cells to take up glucose in the presence of insulin.^{60,61}

Cinnamon also upregulates production of the metabolic sensors known as PPARs, which are being investigated by pharmaceutical companies as sources for anti-diabetic drug development.⁶² PPARs represent another mechanism by which cells recognize increased glucose concentrations and act to lower them. Increased PPAR activity contributes to improved insulin sensitivity.

In human studies, cinnamon supplementation lowers blood sugar and increases insulin sensitivity.⁶³ It blunts the spike in glucose levels following ingestion of a sugar-rich meal, and at the same time lowers insulin spikes.^{64,65}





Cinnamon also helps to increase **satiety**, the feeling of being full that prevents us from eating more than we should.⁶⁶

Cinnamon has also been shown to lower blood pressure, enhancing its anti-metabolic syndrome effects.⁶⁷ The combination of reduced blood sugar, reduced blood pressure, and improved body composition promises tremendous health benefits in adults with early metabolic syndrome but without signs of diabetes.⁶⁸

These effects powerfully lower the body's total exposure to excess glucose. But cinnamon *also* acts to prevent glucose-induced tissue damage, reducing protein glycation and preventing the cumulative effects of AGEs.⁶⁹ Cinnamon supplements have shown promise, for example, in reducing diabetic neuropathy, the painful and debilitating nerve injury that results from glycation of neural proteins.⁷⁰ And cinnamon's polyphenols have anti-inflammatory, antimicrobial, antitumor, cholesterol-lowering, and immunomodulatory effects that contribute to our overall disease risk reduction.⁷¹ Specifically, cinnamon extracts have been shown to reduce levels of the fat tissue-derived inflammatory cytokines that increase our risk of cardiovascular disease.⁷²

Summary

Up to **50%** of the American population is deficient in chromium, one of the principal nutrients the body needs to control blood sugar levels. A novel chromium complex has been identified that optimizes your body's ability to break down and convert blood sugar into energy *at the cellular level*.

The organic compounds *amla* (Indian gooseberry) and *shilajit* work synergistically to enhance chromium's glucose-lowering effects. Amla shields cells from damage inflicted by high blood sugar, while shilajit boosts efficient cellular metabolism of glucose.

In human studies, cinnamon supplementation lowers blood sugar and increases insulin sensitivity.

Cinnamon polyphenols activate cells' glucose detection systems, enabling them to act more quickly to counter high blood sugar. Cinnamon also induces the feeling of being full (satiety) to prevent overconsumption and the after-meal spikes in blood sugar and

insulin that result. Extracts of brown seaweed help prevent glucose elevations by blocking digestive enzymes and limiting glucose absorption from the intestine.

Taken together, these nutrients provide aging individuals with potent natural mechanisms to suppress fasting blood glucose levels to optimal ranges (below 86 mg/dL) while blunting dangerous after-meal glucose spikes. ●

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

- Mertz W, Angino EE, Cannon HL, Hambidge KM, Voors AW. Chromium. In: US National Committee for Geochemistry. Subcommittee on the Geochemical Environment. *Geochemistry and the Environment. Volume I. The Relation of Selected Trace Elements to Health and Disease*. Washington, D.C.: National Academy of Sciences; 1974:29-35.
- Available at <http://www.drweil.com/drw/u/ART02868/chromium.html>. Accessed November 20, 2010.
- Striffler JS, Polansky M, Anderson RA. Overproduction of insulin in the chromium-deficient rat. *Metabolism*. 1999;48(8):1063-8.
- Vincent JB. Mechanisms of chromium action: low-molecular-weight chromium-binding substance. *J Am Coll Nutr*. 1999 Feb;18(1):6-12.
- Terpiowska S, Zaporowska H. The role of chromium in cell biology and medicine. *Przegl Lek*. 2004;61 Suppl 3:51-4.
- Anderson RA, Cheng N, Bryden NA, Polansky MM, Chi J, Feng J. Elevated intakes of supplemental chromium improve glucose and insulin variables in individuals with type 2 diabetes. *Diabetes*. 1997 Nov;46(11):1786-91.
- Linday LA. Trivalent chromium and the diabetes prevention program. *Med Hypotheses*. 1997 Jul;49(1):47-9.
- Bahijri SM, Mira SA, Mufti AM, Ajabnoor MA. The effects of inorganic chromium and brewer's yeast supplementation on glucose tolerance, serum lipids and drug dosage in individuals with type 2 diabetes. *Saudi Med J*. 2000 Sep;21(9):831-7.
- Bahijri SM. Effect of chromium supplementation on glucose tolerance and lipid profile. *Saudi Med J*. 2000 Jan;21(1):45-50.
- Vincent JB. Quest for the molecular mechanism of chromium action and its relationship to diabetes. *Nutr Rev*. 2000 Mar;58(3 Pt 1):67-72.
- Chen WY, Chen CJ, Liu CH, Mao FC. Chromium supplementation enhances insulin signalling in skeletal muscle of obese KK/HIJ diabetic mice. *Diabetes Obes Metab*. 2009 Apr;11(4):293-303.
- Pohl M, Mayr P, Mertl-Roetzer M, et al. Glycemic control in patients with type 2 diabetes mellitus with a disease-specific enteral formula: stage II of a randomized, controlled multicenter trial. *JPEN J Parenter Enteral Nutr*. 2009 Jan-Feb;33(1):37-49.
- Albaracin CA, Fuqua BC, Evans JL, Goldfine ID. Chromium picolinate and biotin combination improves glucose metabolism in treated, uncontrolled overweight to obese patients with type 2 diabetes. *Diabetes Metab Res Rev*. 2008 Jan-Feb;24(1):41-51.
- Ryan GJ, Wanko NS, Redman AR, Cook CB. Chromium as adjunctive treatment for type 2 diabetes. *Ann Pharmacother*. 2003 Jun;37(6):876-85.
- Cefalu WT, Rood J, Pinsonat P, et al. Characterization of the metabolic and physiologic response to chromium supplementation in subjects with type 2 diabetes mellitus. *Metabolism*. 2010 May;59(5):755-62.
- Frauchiger MT, Wenk C, Colombani PC. Effects of acute chromium supplementation on postprandial metabolism in healthy young men. *J Am Coll Nutr*. 2004 Aug;23(4):351-7.
- Jain SK, Patel P, Rogier K. Trivalent chromium inhibits protein glycosylation and lipid peroxidation in high glucose-treated erythrocytes. *Antioxid Redox Signal*. 2006 Jan-Feb;8(1-2):238-41.
- Keszthelyi Z, Past T, Koltai K, Szabo L, Mozsik G. Chromium (III)-ion enhances the utilization of glucose in type-2 diabetes mellitus. *Orv Hetil*. 2003 Oct 19;144(42):2073-6.
- Geohas J, Daly A, Juturu V, Finch M, Komorowski JR. Chromium picolinate and biotin combination reduces atherogenic index of plasma in patients with type 2 diabetes mellitus: a placebo-controlled, double-blinded, randomized clinical trial. *Am J Med Sci*. 2007 Mar;333(3):145-53.
- Jain SK, Rains JL, Croad JL. High glucose and ketosis (acetoacetate) increases, and chromium niacinate decreases, IL-6, IL-8, and MCP-1 secretion and oxidative stress in U937 monocytes. *Antioxid Redox Signal*. 2007 Oct;9(10):1581-90.
- Clodfelder BJ, Emamauillee J, Hepburn DD, Chakov NE, Nettles HS, Vincent JB. The trail of chromium(III) in vivo from the blood to the urine: the roles of transferrin and chromodulin. *J Biol Inorg Chem*. 2001 Jun;6(5-6):608-17.
- Chen G, Liu P, Pattar GR, et al. Chromium activates glucose transporter 4 trafficking and enhances insulin-stimulated glucose transport in 3T3-L1 adipocytes via a cholesterol-dependent mechanism. *Mol Endocrinol*. 2006 Apr;20(4):857-70.
- Lund S, Holman GD, Schmitz O, Pedersen O. Contraction stimulates translocation of glucose transporter GLUT4 in skeletal muscle through a mechanism distinct from that of insulin. *Proc Natl Acad Sci U S A*. 1995 Jun 20;92(13):5817-21.
- James DE, Brown R, Navarro J, Pilch PF. Insulin-regulatable tissues express a unique insulin-sensitive glucose transport protein. *Nature*. 1988 May 12;333(6169):183-5.
- James DE, Strube M, Mueckler M. Molecular cloning and characterization of an insulin-regulatable glucose transporter. *Nature*. 1989 Mar 2;338(6210):83-7.
- Pattar GR, Tackett L, Liu P, Elmendorf JS. Chromium picolinate positively influences the glucose transporter system via affecting cholesterol homeostasis in adipocytes cultured under hyperglycemic diabetic conditions. *Mutat Res*. 2006 Nov 7;610(1-2):93-100.
- Eyster CA, Olson AL. Compartmentalization and regulation of insulin signaling to GLUT4 by the cytoskeleton. *Vitam Horm*. 2009;80:193-215.
- Lauritzen HP. In vivo imaging of GLUT4 translocation. *Appl Physiol Nutr Metab*. 2009 Jun;34(3):420-3.
- Leney SE, Tavare JM. The molecular basis of insulin-stimulated glucose uptake: signalling, trafficking and potential drug targets. *J Endocrinol*. 2009 Oct;203(1):1-18.
- Wu YT, Sun Z, Che SP, Wang X, Wang Y, Guo G. Regulation of chromium on gene expression of skeletal muscles in diabetic rats. *Wei Sheng Yan Jiu*. 2005 Mar;34(2):184-7.
- Qiao W, Peng Z, Wang Z, Wei J, Zhou A. Chromium improves glucose uptake and metabolism through upregulating the mRNA levels of IR, GLUT4, GS, and UCP3 in skeletal muscle cells. *Biol Trace Elem Res*. 2009 Nov;131(2):133-42.
- Wang YQ, Yao MH. Effects of chromium picolinate on glucose uptake in insulin-resistant 3T3-L1 adipocytes involve activation of p38 MAPK. *J Nutr Biochem*. 2009 Dec;20(12):982-91.
- Manjunatha S, Jaryal AK, Bijlani RL, Sachdeva U, Gupta SK. Effect of Chyawanprash and vitamin C on glucose tolerance and lipoprotein profile. *Indian J Physiol Pharmacol*. 2001 Jan;45(1):71-9.
- Babu PS, Stanely Mainzen Prince P. Antihyperglycaemic and antioxidant effect of hyponidd, an ayurvedic herbomineral formulation in streptozotocin-induced diabetic rats. *J Pharm Pharmacol*. 2004 Nov;56(11):1435-42.
- Nampoothiri SV, Prathapan A, Cherian OL, Raghu KG, Venugopalan VV, Sundaresan A. In vitro antioxidant and inhibitory potential of Terminalia bellerica and Emblica officinalis fruits against LDL oxidation and key enzymes linked to type 2 diabetes. *Food Chem Toxicol*. 2010 Oct 14.

36. Rao TP, Sakaguchi N, Juneja LR, Wada E, Yokozawa T. Amla (*Emblica officinalis* Gaertn.) extracts reduce oxidative stress in streptozotocin-induced diabetic rats. *J Med Food.* 2005 Fall;8(3):362-8.
37. Patel SS, Shah RS, Goyal RK. Antihyperglycemic, antihyperlipidemic and antioxidant effects of Dihar, a polyherbal ayurvedic formulation in streptozotocin induced diabetic rats. *Indian J Exp Biol.* 2009 Jul;47(7):564-70.
38. Suryanarayana P, Kumar PA, Saraswat M, Petrash JM, Reddy GB. Inhibition of aldose reductase by tannoid principles of *Emblica officinalis*: implications for the prevention of sugar cataract. *Mol Vis.* 2004 Mar 12;10:148-54.
39. Suryanarayana P, Saraswat M, Petrash JM, Reddy GB. *Emblica officinalis* and its enriched tannoids delay streptozotocin-induced diabetic cataract in rats. *Mol Vis.* 2007;13:1291-7.
40. Kim HY, Okubo T, Juneja LR, Yokozawa T. The protective role of amla (*Emblica officinalis* Gaertn.) against fructose-induced metabolic syndrome in a rat model. *Br J Nutr.* 2010 Feb;103(4):502-12.
41. Meena H, Pandey HK, Arya MC, Ahmed Z. Shilajit: A panacea for high-altitude problems. *Int J Ayurveda Res.* 2010 Jan;1(1):37-40.
42. Klapper L, McKnight DM, Fulton JR, et al. Fulvic acid oxidation state detection using fluorescence spectroscopy. *Environ Sci Technol.* 2002 Jul 15;36(14):3170-5.
43. Royer RA, Burgos WD, Fisher AS, Unz RF, Dempsey BA. Enhancement of biological reduction of hematite by electron shuttling and Fe(II) complexation. *Environ Sci Technol.* 2002 May 1;36(9):1939-46.
44. Kang SH, Choi W. Oxidative degradation of organic compounds using zero-valent iron in the presence of natural organic matter serving as an electron shuttle. *Environ Sci Technol.* 2009 Feb 1;43(3):878-83.
45. Visser SA. Effect of humic substances on mitochondrial respiration and oxidative phosphorylation. *Sci Total Environ.* 1987 Apr;62:347-54.
46. Kim KY, Nguyen TH, Kurihara H, Kim SM. Alpha-glucosidase inhibitory activity of bromophenol purified from the red alga *Polyopaea lancifolia*. *J Food Sci.* 2010 Jun;75(5):H145-50.
47. Apostolidis E, Lee CM. In vitro potential of *Ascophyllum nodosum* phenolic antioxidant-mediated alpha-glucosidase and alpha-amylase inhibition. *J Food Sci.* 2010 Apr;75(3):H97-102.
48. Kim KY, Nam KA, Kurihara H, Kim SM. Potent alpha-glucosidase inhibitors purified from the red alga *Grateloupia elliptica*. *Phytochemistry.* 2008 Nov;69(16):2820-5.
49. Zhang J, Tiller C, Shen J, et al. Antidiabetic properties of polysaccharide- and polyphenolic-enriched fractions from the brown seaweed *Ascophyllum nodosum*. *Can J Physiol Pharmacol.* 2007 Nov;85(11):1116-23.
50. Heo SJ, Hwang JY, Choi JI, Han JS, Kim HJ, Jeon YJ. Diphlorethohydroxycarmalol isolated from *Ishige okamurae*, a brown algae, a potent alpha-glucosidase and alpha-amylase inhibitor, alleviates postprandial hyperglycemia in diabetic mice. *Eur J Pharmacol.* 2009 Aug 1;615(1-3):252-6.
51. Lamela M, Anca J, Villar R, Otero J, Calleja JM. Hypoglycemic activity of several seaweed extracts. *J Ethnopharmacol.* 1989 Nov;27(1-2):35-43.
52. Iwai K. Antidiabetic and antioxidant effects of polyphenols in brown alga *Ecklonia stolonifera* in genetically diabetic KK-A(y) mice. *Plant Foods Hum Nutr.* 2008 Dec;63(4):163-9.
53. Ruperez P, Ahrazem O, Leal JA. Potential antioxidant capacity of sulfated polysaccharides from the edible marine brown seaweed *Fucus vesiculosus*. *J Agric Food Chem.* 2002 Feb 13;50(4):840-5.
54. Kim SN, Choi HY, Lee W, Park GM, Shin WS, Kim YK. Sargaquinoic acid and sargahydroquinone acid from *Sargassum yezoense* stimulate adipocyte differentiation through PPAR α /gamma activation in 3T3-L1 cells. *FEBS Lett.* 2008 Oct 15;582(23-24):3465-72.
55. Kang SI, Jin YJ, Ko HC, et al. Petalonia improves glucose homeostasis in streptozotocin-induced diabetic mice. *Biochem Biophys Res Commun.* 2008 Aug 22;373(2):265-9.
56. Cao H, Polansky MM, Anderson RA. Cinnamon extract and polyphenols affect the expression of tristetraprolin, insulin receptor, and glucose transporter 4 in mouse 3T3-L1 adipocytes. *Arch Biochem Biophys.* 2007 Mar 15;459(2):214-22.
57. Lu Z, Jia Q, Wang R, et al. Hypoglycemic activities of A- and B-type procyanidin oligomer-rich extracts from different Cinnamon barks. *Phytomedicine.* 2010 Sep 17.
58. Qin B, Panickar KS, Anderson RA. Cinnamon: potential role in the prevention of insulin resistance, metabolic syndrome, and type 2 diabetes. *J Diabetes Sci Technol.* 2010 May;4(3):685-93.
59. Roussel AM, Hininger I, Benaraba R, Ziegenfuss TN, Anderson RA. Antioxidant effects of a cinnamon extract in people with impaired fasting glucose that are overweight or obese. *J Am Coll Nutr.* 2009 Feb;28(1):16-21.
60. Kim W, Khil LY, Clark R, et al. Naphthalenemethyl ester derivative of dihydroxyhydrocinnamic acid, a component of cinnamon, increases glucose disposal by enhancing translocation of glucose transporter 4. *Diabetologia.* 2006 Oct;49(10):2437-48.
61. Kim W, Khil LY, Clark R, et al. Naphthalenemethyl ester derivative of dihydroxyhydrocinnamic acid, a component of cinnamon, increases glucose disposal by enhancing translocation of glucose transporter 4. *Diabetologia.* 2006 Oct;49(10):2437-48.
62. Sheng X, Zhang Y, Gong Z, Huang C, Zang YQ. Improved Insulin Resistance and Lipid Metabolism by Cinnamon Extract through Activation of Peroxisome Proliferator-Activated Receptors. *PPAR Res.* 2008;2008:581348.
63. Solomon TP, Blannin AK. Effects of short-term cinnamon ingestion on in vivo glucose tolerance. *Diabetes Obes Metab.* 2007 Nov;9(6):895-901.
64. Hlebowicz J, Hlebowicz A, Lindstedt S, et al. Effects of 1 and 3 g cinnamon on gastric emptying, satiety, and postprandial blood glucose, insulin, glucose-dependent insulintropic polypeptide, glucagon-like peptide 1, and ghrelin concentrations in healthy subjects. *Am J Clin Nutr.* 2009 Mar;89(3):815-21.
65. Solomon TP, Blannin AK. Changes in glucose tolerance and insulin sensitivity following 2 weeks of daily cinnamon ingestion in healthy humans. *Eur J Appl Physiol.* 2009 Apr;105(6):969-76.
66. Mettler S, Schwarz I, Colombani PC. Additive postprandial blood glucose-attenuating and satiety-enhancing effect of cinnamon and acetic acid. *Nutr Res.* 2009 Oct;29(10):723-7.
67. Akilen R, Tsiami A, Devendra D, Robinson N. Glycated haemoglobin and blood pressure-lowering effect of cinnamon in multi-ethnic Type 2 diabetic patients in the UK: a randomized, placebo-controlled, double-blind clinical trial. *Diabet Med.* 2010 Oct;27(10):1159-67.
68. Ziegenfuss TN, Hofheins JE, Mendel RW, Landis J, Anderson RA. Effects of a water-soluble cinnamon extract on body composition and features of the metabolic syndrome in pre-diabetic men and women. *J Int Soc Sports Nutr.* 2006;3:45-53.
69. Peng X, Ma J, Chao J, et al. Beneficial effects of cinnamon proanthocyanidins on the formation of specific advanced glycation endproducts and methylglyoxal-induced impairment on glucose consumption. *J Agric Food Chem.* 2010 Jun 9;58(11):6692-6.
70. Bahceci S, Alucu MU, Canoruc N, et al. Ultrastructural evaluation of the effects of cinnamon on the nervus ischiadicus in diabetic rats. *Neurosciences (Riyadh).* 2009 Oct;14(4):338-42.
71. Gruenwald J, Freder J, Armbreuster N. Cinnamon and health. *Crit Rev Food Sci Nutr.* 2010 Oct;50(9):822-34.
72. Qin B, Polansky MM, Anderson RA. Cinnamon extract regulates plasma levels of adipose-derived factors and expression of multiple genes related to carbohydrate metabolism and lipogenesis in adipose tissue of fructose-fed rats. *Horm Metab Res.* 2010 Mar;42(3):187-93.

Go Green, Get Healthy

Turns out, the advice you got as a child to "eat your greens" could pay major dividends as an adult. Scientists have recently identified extracts from green vegetables like broccoli, cabbage, and Brussels sprouts that help maintain healthy hormone levels. Having optimal hormone levels is essential to any anti-aging strategy. In addition, many of these extracts contain *glucosinolates*, *isothiocyanates*, *carnosic acid*, and *carnosol* – bioactive compounds that have a wide variety of favorable effects on estrogen metabolism and cell division.¹⁻⁴

Triple Action Cruciferous Vegetable Extract with Apigenin combines a **broccoli Super Concentrate** with **watercress**, **Indole-3-Carbinol (I3C)**, **rosemary extract**, **cat's claw extract**, **cabbage extract**, **DIM**, and **apigenin**, a powerful plant flavonoid found in plants such as **parsley** and **celery**, to form the most comprehensive cruciferous vegetable supplement available.⁵

For those who don't have the time to consume each of the above vegetables each and every day, **Triple Action Cruciferous Vegetable Extract with Apigenin** is the perfect solution to making sure your body gets the important extracts it needs from these crucial food sources. For those weighing less than 160 pounds, just one vegetarian capsule a day provides optimal potencies. Those weighing over 160 pounds should consider taking two capsules a day. A 60-vegetarian capsule bottle of **Triple Action Cruciferous Vegetable Extract** retails for \$24. If a member buys four bottles during **Super Sale**, the price is reduced to only **\$14.85 per bottle**.

Those who want to obtain the benefits of **resveratrol** can order **Triple Action Cruciferous Vegetable Extract with Resveratrol**. Each capsule provides **20 mg** of **resveratrol** in addition to the **vegetable extracts** and retails for \$32 per 60-capsule bottle. When a member buys four bottles during **Super Sale**, the price is reduced to only **\$19.98 per bottle**.



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Triple Action Cruciferous Vegetable Extract provides the following concentrates in just one vegetarian capsule:

Broccoli Super Concentrate	400 mg
[standardized to 4% glucosinolates (16 mg)]	
Watercress 4:1 extract	50 mg
Indole-3-Carbinol (I3C)	80 mg
Rosemary Extract	50 mg
Cat's Claw Extract	50 mg
Cabbage Extract	25 mg
DIM (di-indolyl-methane)	14 mg
Apigenin	25 mg

Contains yeast and corn.

REFERENCES:

1. *Carcinogenesis*. 2002 Apr;23(4):581-6.
2. *Mol Cancer Ther*. 2003 Oct;2(10):1045-52.
3. *Carcinogenesis*. 1998 Oct;19(10):1821-7.
4. *Carcinogenesis*. 1995 Sep;16(9):2057-62.
5. *J Clin Biochem Nutr*. 2009 May;44(3):260-5.
6. *Food Chem Toxicol*. 2008 Jul;46(7):2358-64.

To order Triple Action Cruciferous Vegetable Extract, call 1-800-544-4440 or visit www.LifeExtension.com



ARE YOU TAKING THE OPTIMAL FORMS OF VITAMIN E?

According to the *Proceedings of the National Academy of Sciences*, alpha tocopherol (regular vitamin E) displaces critically important gamma tocopherol in the cells.¹ While alpha tocopherol inhibits free-radical production, gamma tocopherol is required to trap and neutralize existing free radicals.²

Four prestigious scientific journals have highlighted **gamma tocopherol** as one of the most critically important forms of **vitamin E** for those seeking optimal health benefits.

Most commercial vitamin E supplements contain little, if any, **gamma tocopherol**. They instead rely on **alpha tocopherol** as the primary ingredient. However, it is gamma tocopherol (not the alpha form) that quenches **peroxynitrite**, the free radical that plays a major role in the development of age-related decline.^{2,3}

SESAME LIGNANS: The Natural Vitamin E Booster

Life Extension® has uncovered research suggesting that adding **sesame lignans** to gamma tocopherol may significantly enhance its beneficial effects. Sesame and its lignans have been shown to boost antioxidant levels and help maintain already-normal blood pressure.*

In a human study that combined **gamma tocopherol** with **sesame lignans**, gamma tocopherol/sesame was **25% more effective** than gamma tocopherol/tocotrienols in suppressing tissue measurements for free-radical and inflammatory damage.^{4,5} Since tocotrienols are considered nature's most potent antioxidants, the fact that low-cost gamma tocopherol with sesame is more effective is a remarkable finding.

Life Extension fortified the popular **Gamma E Tocopherol** supplement with standardized **sesame lignans**. Consumers obtain superior benefits at a much **lower cost**.

WORLD'S MOST COMPREHENSIVE VITAMIN E FORMULA!

The **Gamma E Tocopherol** formula provides potent doses of critically important gamma vitamin E along with **sesame lignans** to augment its antioxidant effects.

The retail price for 60 softgels of **Gamma E Tocopherol with Sesame Lignans** is **\$32**. If a member buys four bottles during **Super Sale**, the price is reduced to only **\$19.58 per bottle**.

Each softgel of Gamma E Tocopherol with Sesame Lignans provides:

Gamma tocopherol	215.4-244.12 mg
Delta tocopherol	89.75-125.65 mg
Alpha tocopherol	17.95-35.9 mg
Beta tocopherol	0-7.18 mg
Sesame seed (<i>Sesamum indicum</i>) lignan extract	20 mg



Item #00759

Contains soybeans and sesame.

Antioxidant Vitamins & Cancer. Some scientific evidence suggests that consumption of antioxidant vitamins may reduce the risk of certain forms of cancer. However, the FDA does not endorse this claim because this evidence is limited and not conclusive.

Note: Those taking Super Booster do not usually require additional gamma tocopherol.

References

1. *J Natl Cancer Inst.* 2000 Dec 20;92(24):1966-7.
2. *Proc Natl Acad Sci USA.* 1997 Apr 1; 94(7):3217-22.
3. *Atherosclerosis.* 1999 May;144(1):117-22.
4. *J Nutr.* 1992 Dec;122(12):2440-6.
5. *Lipids.* 1995 Nov;30(11):1019-28.

To order **Gamma E Tocopherol with Sesame Lignans**, 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.



Take Control of
Excess Glucose Calories
with new...

CinSulin® with InSea™ and Crominex® 3+

Cutting-Edge Support for Healthy Glucose Metabolism

Dietary carbohydrates are nearly impossible to avoid in today's "grab-and-go" world. The result? Countless aging Americans find themselves under constant assault from excess **glucose** calories. Even health-conscious, active people can experience higher-than-desired blood sugar levels as they age. **Life Extension®** now offers an enhanced, all-natural, *multipronged* approach called **CinSulin® with InSea™ and Crominex® 3+.**

An Extract Clinically Validated by the USDA!

Excitement has been building among scientists around the world over the clinically proven power of a novel form of **cinnamon** to support healthy glucose metabolism.

Scientists at the **US Department of Agriculture** have been quietly studying it *for more than a decade*.^{1,2} Government experts have been amazed by compelling *in vitro* results documenting its ability to induce a **twenty-fold** increase in sugar metabolism.³

Studies in humans have proven just as impressive. In a recent double-blind, placebo-controlled clinical trial,⁴ a group of maturing individuals (average age 61) taking **500 mg** per day of the cinnamon extract contained in the new **CinSulin®** formula experienced an average *decline* of **12 mg/dL** in fasting blood glucose after only two months. This novel cinnamon extract also produced a significant decrease in **after-meal glucose spikes** (an average of **32 mg/dL**) after ingestion of **75 g** of carbohydrates!

An objective of those who practice **calorie restriction** is to maintain **fasting glucose** levels around **80 mg/dL** of blood and after-meal glucose spikes to no greater than **40 mg/dL**. CinSulin® may help more longevity enthusiasts accomplish their glucose control objective.



Standardized for Purity and Safety

The danger with cinnamon is the presence of naturally occurring, toxic fat-soluble compounds known as *aldehydes*.

Life Extension® has identified a highly purified "type-A" **water-soluble cinnamon extract** using a patented process that eliminates these dangerous toxins.



Carb Blockers from the Sea

Researchers have known of the many health benefits of **seaweed extracts** for years.

Only recently has it come to light that a proprietary form of **seaweed** extract called **InSea™** blocks the action of **glucosidase** and **amylase**—enzymes your body uses to break down **carbohydrates** into glucose, facilitating its transport into the bloodstream.

Derived from **brown seaweed** and **bladderwrack**, a single **500 mg** dose of this proprietary compound triggered a **48.3% decline** in after-meal blood sugar spikes in a recent double-blind, placebo controlled trial.⁵

Better Glucose Absorption with Novel Chromium Complex

Long known for its role in maintaining healthy glucose metabolism, **chromium** has been **optimized** with standardized extract of **Indian gooseberry** and a proprietary form of the adaptogen **shilajit**. The name of this most advanced chromium complex is **Crominex® 3+**. The **Crominex® 3+** complex helps support:

- **Normal cellular glucose absorption⁶⁻¹⁰**
- **Healthy endothelial function^{11,12}**
- **Healthy lipid and triglyceride levels¹³⁻¹⁶**
- **Normal cellular energy production^{17,18}**

Combined with **CinSulin®** and **InSea™**, the result is an unrivaled formula that affords optimal support for healthy glucose metabolism in aging individuals. The suggested serving of 1 vegetarian capsule of **CinSulin® with InSea™ and Crominex® 3+** taken 20-30 minutes before three meals of the day supplies:

CinSulin®	525 mg
InSea™	300 mg
Chromium (as Crominex® 3+)	399 mcg



Item #01503

A bottle containing 90 vegetarian capsules of **CinSulin® with InSea™ and Crominex® 3+** retails for \$38. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$22.95** per bottle.

Contains rice.

To order CinSulin® with InSea™ and Crominex® 3+ or Optimized Chromium with Crominex® 3+ call 1-800-544-4440 or visit www.LifeExtension.com

For Those Who Want Only Extra Chromium

For those wishing to obtain the unique benefits of the novel chromium complex (chromium plus Indian gooseberry and shilajit), **Life Extension®** also now offers a standalone version of **Optimized Chromium with Crominex® 3+**.

A bottle containing 60 **500 mcg** vegetarian capsules of **Optimized Chromium with Crominex® 3+** retails for \$9. If a member buys four bottles during **Super Sale**, the cost is just **\$5.40** per bottle.



Item #01504

CinSulin® is a registered trademark of Tang-An Medical Ltd., manufactured under US patent #6,200,569. **InSea™** a trademark of innoVativ™. **Crominex® 3+** is a registered trademark of Natreon, Inc.

References

1. *J Agric Food Chem.* 2000 Mar; 48(3):849-52.
2. *Phytomedicine.* 2010 May 27.
3. *J Agric Food Chem.* 2004 Jan 14;52(1):65-70
4. *FASEB J.* 2010; 24:722.1.
5. *J Metab.* Submitted for publication.
6. *Diabetes Res Clin Pract.* 1995 Jun;28(3):179-84.
7. *Diabetes.* 1997 Nov;46(11):1786-91.
8. *Ned Tijdschr Geneeskd.* 2004 Jan 31;148(5):217-20.
9. *Altern Med Rev.* 2002 Jun;7(3):218-35.
10. *Saudi Med J.* 2000 Jan;21(1):45-50.
11. *Br J Nutr.* 2007 Jun;97(6):1187-95.
12. *Yakugaku Zasshi.* 2005 Jul;125(7):587-91.
13. *J Ethnopharmacol.* 2002 Jan;79(1):81-7.
14. *J Nutr Sci Vitaminol (Tokyo).* 2005 Dec;51(6):413-8.
15. *Yakugaku Zasshi.* 2007 Feb;127(2):385-8.
16. *Indian J Exp Biol.* 2001 Aug;39(8):760-6.
17. *Indian J Exp Biol.* 1997 Mar;35(3):297-9.
18. *Phytother Res.* 2007 May;21(5):401-5.



Suzanne Somers's New Mission to Lift the Veil of Scientific Ignorance

What will it take for the public to understand that the **diseases of aging** can be postponed or prevented altogether?

For 31 years, we at **Life Extension®** have published solid scientific data documenting that healthy lifestyle choices can slash disease risk.

Yet as we begin year 2011, two-thirds of Americans are overweight or obese. Their youth is being robbed by an epidemic of **metabolic syndrome** and **diabetes** that sharply increases incidences of cancer, vascular occlusion, arthritis, dementia, and virtually every other age-related disorder.

Membership in the **Life Extension Foundation** is at an all-time high, but we reach only a minute fraction of the American population. The vast majority of individuals today wallow in a state of ignorance about what they should be doing to protect their vital health.

While we at **Life Extension** can point to our extensive track record of scientific achievements, the public remains largely unimpressed. When a famous celebrity, however, appears on national television to espouse many of these same anti-aging strategies, the average person stops to notice.

There is something in the human psyche that prompts people to emulate what celebrities do - whether it's good or bad.

In the case of **Suzanne Somers**, she has turned her life around by removing

toxic compounds from her environment, eating organic foods, meticulously keeping her hormones in natural balance, having her blood regularly tested, and taking the appropriate supplements.

Suzanne is by no means the only prominent personality doing this. After all, Hollywood has long emphasized youthful appearances - and those involved in show business are perhaps the earliest examples of humans taking aggressive steps to thwart degenerative changes both inward and outward.

What differentiates Suzanne from our many other celebrity members is that she shouts from the rooftops the many virtues she has attained by following a meticulous science-based youth restoration program.

In her latest book titled ***Sexy Forever***, Suzanne reveals to the public much of the data that Life Extension members view as commonsense approaches to protect against age-related illness.

What impresses us is the ability of **Suzanne Somers** to appear in the national media and enlighten the world as to how humans can successfully intervene into pathological aging processes. By lifting the veil of scientific ignorance, Suzanne can singlehandedly educate the public about proven methods to avoid diseases that needlessly cripple and kill millions of Americans each year.

The following is an excerpt from the chapter titled ***Supplement to Speed Weight Loss*** in ***Sexy Forever***. > >



SUPPLEMENT TO SPEED WEIGHT LOSS

EXPERTS WEIGH IN: A Brief Interview with Cristiana Paul

Cristiana Paul, MS, is an independent nutrition consultant in the Los Angeles area and my personal nutritionist. She is an avid reviewer of nutrition research and educates doctors and patients on nutritional therapies and assessments for optimal health. She is also a contributor to the fourth edition of *The Textbook of Natural Medicine*. Nutrition is the fuel our bodies need to operate. With inferior nutrition our health suffers and we are set up for disease. I asked her how we can stay healthy (and consequently thin) in our toxic environment.

Christiana Paul: For our bodies to function optimally and efficiently we need to consume a diet balanced with the right amounts of protein, good fat, unrefined carbohydrates, and lots and lots of various forms of fiber (soluble and insoluble). All these aspects are important to maximize fat burning and support body renewal and function. Most of us need to supplement because we do not get enough nutrients due to poor diet and the deficiency of our soils. The most important supplements are vitamins, minerals, and essential fatty acids, but a few others also play important roles. Relative to weight control, here are some good examples of supplements that may be useful because they are very involved in fat and carbohydrate burning:

Carnitine

This supplement helps fat transport in the mitochondria, where it has a chance to be burned. Carnitine is mostly found in red meat, which many people avoid, and it is also synthesized in the body, but sometimes not enough to support optimal fat burning. A urine test can tell us if we need to supplement. Typical doses are 500 to 1,000 mg/day. It may be especially helpful when taken an hour or two prior to exercise.

Lipoic Acid

This plays a role in blood glucose control. If you have elevated or highly fluctuating glucose levels (such as in hypoglycemia) you may consider supplementing with 100 to 1,200 mg (based on a doctor's or nutritionist's evaluation). The bottom line is that lipoic acid will help you burn glucose more efficiently, and in that sense it helps with weight control.

CoQ10

There is a blood test for coenzyme Q10 that tells us if we need to supplement. If you take a statin or red yeast rice, the body's production of CoQ10 is impaired, so you need to supplement even more. CoQ10 is a key factor in energy production and helps us burn fats and carbs more efficiently. In fact, it was shown to help normalize elevated blood glucose in some cases. It also supports heart health and protects the brain. Typical doses are 30 to 100 mg.

Most people are not aware that correcting nutritional deficiencies with a good multivitamin/multimineral and omega-3 supplement will make them much more efficient at burning fat, sugar, and carbohydrates and will also reduce cravings. Blood and urine testing can help a physician analyze each person's needs for supplementation. At the very minimum you want to take a basic multivitamin/multimineral in a formula that has good absorbable ingredients and no unwanted contaminants. You also want the nutrients to be in a form that they occur in nature if they are available—for example, natural folate (not folic acid), natural mixed tocopherols for vitamin E (not just alpha-tocopherol), natural mixed carotenoids (not just beta-carotene), natural vitamin B12 (methylcobalamin or adenosylcobalamin, not cyanocobalamin or hydroxycobalamin), and chelated minerals.

Most people need to supplement with omega-3 fats because their diets provide an excess of omega-6 fats (from cooking oils and animal fats), and it's important to choose fish oil, flaxseed oil, or algae (for vegetarians) that are clean of environmental contaminants (mercury, PCBs) and oxidized fats. Frankly, it is a good idea to ask for a certificate of analysis from the manufacturer for everything you take.

Extracts from green tea were shown in studies to help boost weight loss. It probably does this through a few complementary actions: it boosts the metabolic rate (an increase of 4 percent per twenty-four hours when taking an extract of 370 mg EGCG per day) and it keeps adrenaline elevated longer than normal (which helps fat release from body stores and may reduce hunger). More sustained adrenaline levels may help a person feel more energetic, and he or she may be more likely to exercise or do something physical. For a person with excess adrenaline production (or who has a difficult time breaking it down, such as those with COMT mutations) green tea may increase adrenaline levels to an unhealthy range. On the other hand, for people who are tired all the time because their adrenal glands do not produce adequate amounts of adrenaline, green tea may be helpful. You can drink it or take extracts that contain the equivalent of 2 to 3 cups of green tea in a pill (for example 500 mg EGCG).

Also, keep in mind that the body needs tyrosine (an amino acid found in proteins) to make adrenaline. Supplementing with tyrosine (1 to 2 g/day) may boost production of adrenaline and work synergistically with green tea. Too much adrenaline at night is not good, so it's important to make sure that supplements are not affecting your sleep quality. Poor sleep leads to weight gain and health problems, and this effect can be increased by the addition of coffee.

Fiber is important, so try to get 35 to 50 g of fiber daily from both soluble and insoluble forms (read the label, it will tell you). Variety is important with fiber, and avoiding the artificial colors and sweeteners added to most commercial brands is also important. Fiber will keep you full longer and help you eat less. It slows down the absorption of sugar, thus reducing insulin production in response to meals. Keep in mind that insulin influences the fat cells to reduce the release of their fat content and also slows down certain fat-burning enzymes. This is not because insulin is an evil hormone but because it is supposed to signal that the body has plenty of glucose, telling it: "Burn the glucose first and save the fat from body storages for later." So you see, if you eat excess carbohydrates and sugar all day long, you impair your ability to tap into your fat stores.

Fiber also reduces fat and cholesterol and sugar absorption, and it may lower blood levels of cholesterol and triglycerides. Fiber helps detoxify, supports regular bowel movements, and reduces risks of many cancers. I cannot speak enough about the fiber benefits for weight control and health.



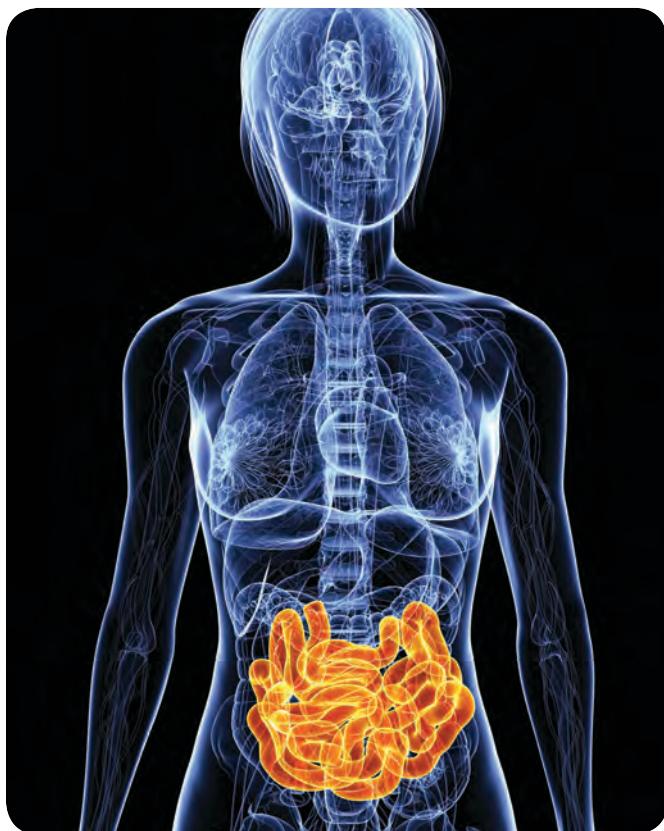
Suzanne Somers: I have been looking for supplements from nature that can speed up and enhance your ability to lose weight. With the help of top bio-scientists, I've discovered a supplement that does just that. This is a science-based product and when I read about the incredible results, all from natural ingredients, I knew I had to make the results available to everyone.

The Sexy Forever Weight Loss Formula includes:

1. LuraLean®
2. *Phaseolus vulgaris*
3. Irvingia
4. Green tea phytosome

LuraLean®

This ingredient helps control the absorption of some calories if taken before the two heaviest meals of the day. By maintaining its viscous structure throughout the digestive tract, LuraLean® is able to stop the absorption of ingested fats and carbohydrates. LuraLean® is a fiber composed of specially processed glucomannan—a water-soluble polysaccharide derived from a tuberous plant that grows only in the remote mountains of northern Japan.



This translates into weight reduction. One clinical study showed that without any dietary changes (participants ate and drank whatever they wanted), those taking LuraLean® lost 5.5 pounds after eight weeks compared to a 1.5-pound weight gain in the placebo group. In a similar study, those taking LuraLean® (twice a day before breakfast and dinner) lost 7.04 pounds compared to a gain of almost 1 pound in the placebo arm of the study. These studies showed substantial reductions in blood triglycerides, cholesterol, and LDL (bad cholesterol) levels in the LuraLean® groups compared to increases in these dangerous blood fats in the placebo arms.

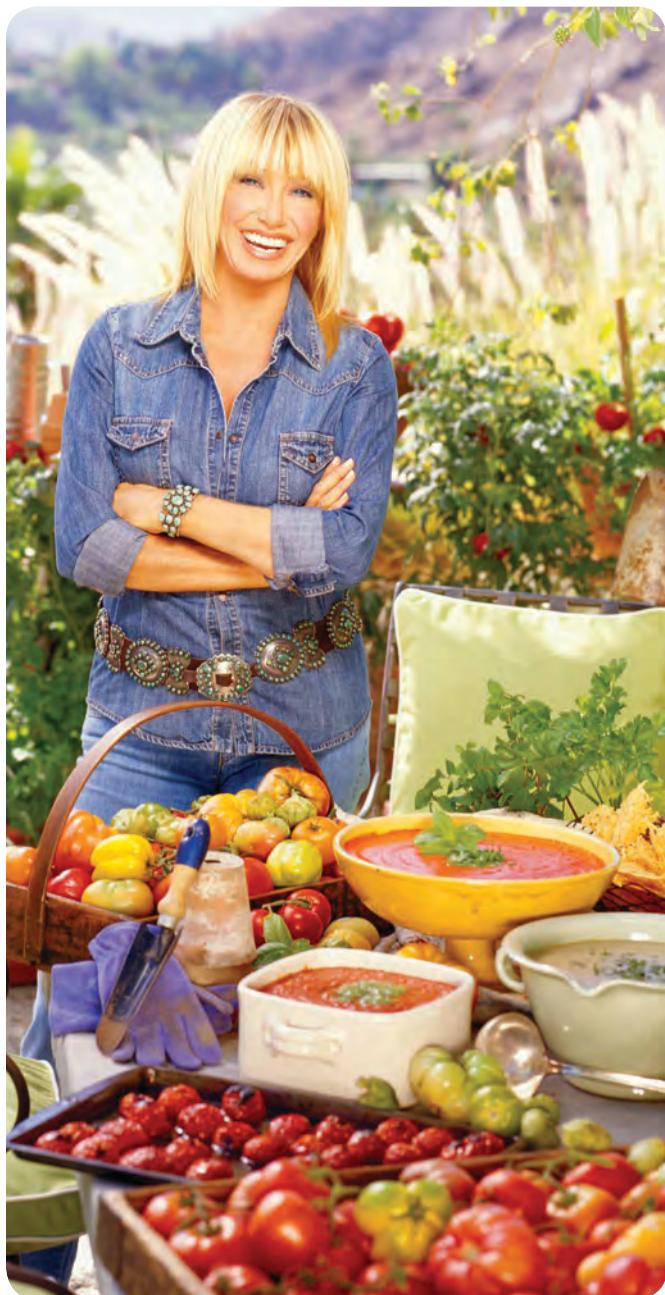
Looking at the blood test results of typical healthy twenty-one-year-olds, scientists noticed that they had very low levels of blood glucose, cholesterol, and triglycerides. Even if people do not change their diet, by the time they reach age fifty their blood glucose, triglycerides, and cholesterol are usually much higher. Fifty-year-olds typically weigh more than when they were twenty-one, especially in the abdominal region of their bodies. There are correlations between blood glucose and triglyceride levels and unwanted weight gain.

To put it simply, the same calories a twenty-one-year-old can safely ingest become increasingly toxic as we age. This is because aging causes us to lose the metabolic capacity to utilize ingested calories in efficient energy-expending ways. Not only do these calories induce body fat storage, but they also increase vascular disease risks. That is why taking LuraLean® before the two heaviest meals of the day is so important. It helps impede absorption of excess sugars and fats in your diet, while helping to reduce the amount of food you consume with each meal.

Phaseolus Vulgaris

Researchers at the UCLA School of Medicine have successfully used extracts from the white kidney bean (*Phaseolus vulgaris*) to target alpha amylase. A study was done where thirty obese adults took either a placebo or the *Phaseolus vulgaris* extract. After eight weeks, those taking the white bean extract lost 3.8 pounds in weight, and more important, 1.5 inches of abdominal fat. The group taking the *Phaseolus vulgaris* also had a three-fold reduction in triglyceride levels compared with the placebo group, which helps corroborate the role of weight loss and simultaneous reduction in artery-clogging triglyceride levels.

Another more impressive study of *Phaseolus vulgaris* showed that those who consumed the most carbohydrates lost the most weight. In this study, subjects who supplemented with *Phaseolus vulgaris* and



consumed the highest levels of dietary starch lost 8.7 pounds compared with only 1.7 pounds in the control group over four weeks. Even more impressive was the 3.3 inches of belly fat lost in the *Phaseolus vulgaris* group versus only 1.3 inches in the controls. In a double-blind study on sixty overweight volunteers, half the study participants received *Phaseolus vulgaris* while the other half were given a placebo. Both groups were placed on a 2,000–2,200-calorie diet. After only thirty days, those taking *Phaseolus vulgaris* lost 6.5 pounds of weight and 1.2 inches in waist size compared with 0.8 pounds and 0.2 inches in the placebo group.

As we age, it becomes increasingly difficult to keep belly fat off. At the same time, we are challenged to keep blood glucose levels in optimal ranges. The exploding rates of type 2 diabetes and obesity are a testament to the dual problem of weight gain caused by the absorption of too many calories from simple carbohydrates.

Irvingia

Irvingia is a West African plant extract (from *Irvingia gabonensis*) that has been shown to help support leptin sensitivity in overweight people. Fat cells (called adipocytes) secrete leptin, a hormone that tells your brain you've eaten enough. Leptin also helps with the breakdown of stored (triglyceride) fat in our fat cells. Overweight people have higher blood levels of leptin, indicating that their cells have become resistant to leptin. In a published study, irvingia demonstrated beneficial effects on leptin blood levels, followed by a weight loss of over 20 pounds on average in ten weeks and an average reduction in waist circumference of about 6 inches. Study subjects taking irvingia reported consuming fewer calories, which makes sense, based on the enhanced leptin sensitivity brought about by this plant extract. Irvingia also has alpha-amylase-inhibiting properties similar to *Phaseolus vulgaris*. Inhibiting amylase helps slow the rate of carbohydrate absorption, reducing the caloric impact of starchy and sugary foods.

Large meals overload the bloodstream with calories and later cause a rebound increase in appetite when blood sugar levels plummet in response to excess release of insulin. One way of stopping this after-meal glucose-insulin rebound is to take nutrients that neutralize the carbohydrate-degrading enzyme alpha-amylase before meals.

Scientific data suggests that irvingia also helps support healthy adiponectin levels. Adiponectin is a hormone that helps maintain the insulin sensitivity of our energy-producing cells. Large fat cells found in overweight people produce less adiponectin. This means that these individuals need to be concerned about maintaining enough adiponectin to support insulin sensitivity, something that we lose during normal aging.

Most people don't know this, but the majority of body fat consists of triglycerides that are stored in our fat cells. A reason that weight loss and triglyceride reduction go hand in hand is that triglycerides make up the bulk of our fat storage. We get triglycerides directly from the fat we eat, and also from the conversion of excess glucose in our blood to triglycerides stored in our fat cells. In the latter instance,



glucose is converted to triglycerides by an enzyme called glycerol-3-phosphate dehydrogenase. Irvingia inhibits glycerol-3-phosphate dehydrogenase, reducing the amount of ingested sugars that are converted to body fat.

Green Tea Phytosome

We all know about the great benefits of green tea. Aging robs us of the ability to efficiently burn fat as energy. Instead we store fat in our adipocytes (fat cells). The components responsible for green tea's weight loss benefits are polyphenol compounds that increase metabolic energy expenditure and hence calorie burning. The problem is getting enough of green tea's polyphenols absorbed into the blood. But a group of Italian researchers created a proprietary green tea phytosome that increased the polyphenols' ability to be absorbed into the bloodstream. In a human clinical trial using this green tea phytosome, the weight loss effects were substantial. This study involved one hundred overweight subjects, half of whom received the green tea phytosome. Both groups were placed on reduced-calorie diets (approximately 1,850 calories/day for men and 1,350 calories/day for women).

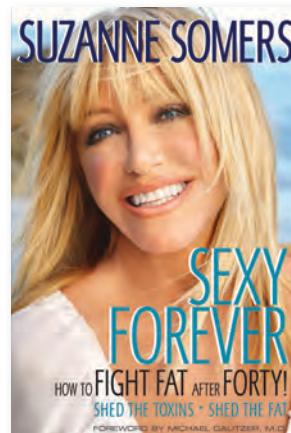
After ninety days on the reduced-calorie diet, the control group lost 9.9 pounds. The group taking the green tea phytosome, on the other hand, lost a whopping 30.1 pounds—more than triple the weight loss of the control group! There was a 10 percent reduction in the green tea phytosome group's belly size compared with a 5 percent reduction in the control group. Male participants did even better in this category, showing a 14 percent reduction in waist circumference compared with a 7 percent reduction in the control group.

What's so interesting about this study is that it shows that people can lose considerable weight (9.9 pounds) by eating fewer calories. Yet when this green tea phytosome was added, the total amount of weight lost tripled (to 30.1 pounds) while twice as much belly fat disappeared. Scientists attribute these remarkable benefits to the ability of green tea to boost resting metabolic rates and reduce the absorption of dietary fats, which makes this green tea phytosome an ideal nutrient to take before heavy meals.

If you are going to turn your life around by eliminating toxic foods, adding these four supplements can boost your ability to lose weight more quickly and safely, with no drugs or stimulants.

To order *Sexy Forever*, call 1-800-544-4440
or visit www.LifeExtension.com

Cover price \$25.99 • Member price \$19.49
Item#33830



For further information
on *Sexy Forever*'s
online companion, visit
www.SexyForeverPlan.com

Excerpt from *Sexy Forever*
by Suzanne Somers.
Published by Crown,
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Suzanne Somers®.

Take a Bite Out of your Appetite

People who struggle with weight loss often point to several “**Achilles’ heels**” that **sabotage their efforts** to keep off the pounds: *eating between meals, grazing at night, and a constant desire to snack*, are among the most common.

The *fantastic news* is that a proprietary extract of **saffron**, called **Satiereal®**, is *clinically proven* to deal with nearly all of the above issues. In fact, women involved in **Satiereal®** studies experienced the following **amazing results**¹⁻⁶:

- **100% reduction in the desire to snack**
- **50% fewer instances of eating between meals**
- **Less hunger**
- **Moderate weight loss**
- **More energy**
- **Better mood**

Say goodbye to “kitchen raids” and say hello to “weight control” with **Optimized Saffron with Satiereal®**.

A bottle containing 60 vegetarian capsules of **Optimized Saffron with Satiereal®** retails for \$36. If a member buys four bottles during **Super Sale**, the cost is just **\$21.60** per bottle.

References

1. *Food in Medieval Times*. Greenwood Publishing; 2004.
2. *Saffron (Crocus sativus) Production and Processing*. Science Publishers; 2006.
3. *Hum Reprod*. 1997 Jun;12(6):1142-51.
4. *BMC Complement Altern Med*. 2004 Sep 2;4:12.
5. *J Ethnopharmacol*. 2005 Feb 28;97(2):281-4.
6. *Prog Neuropsychopharmacol Biol Psychiatry*. 2007 Mar 30;31(2):439-42.

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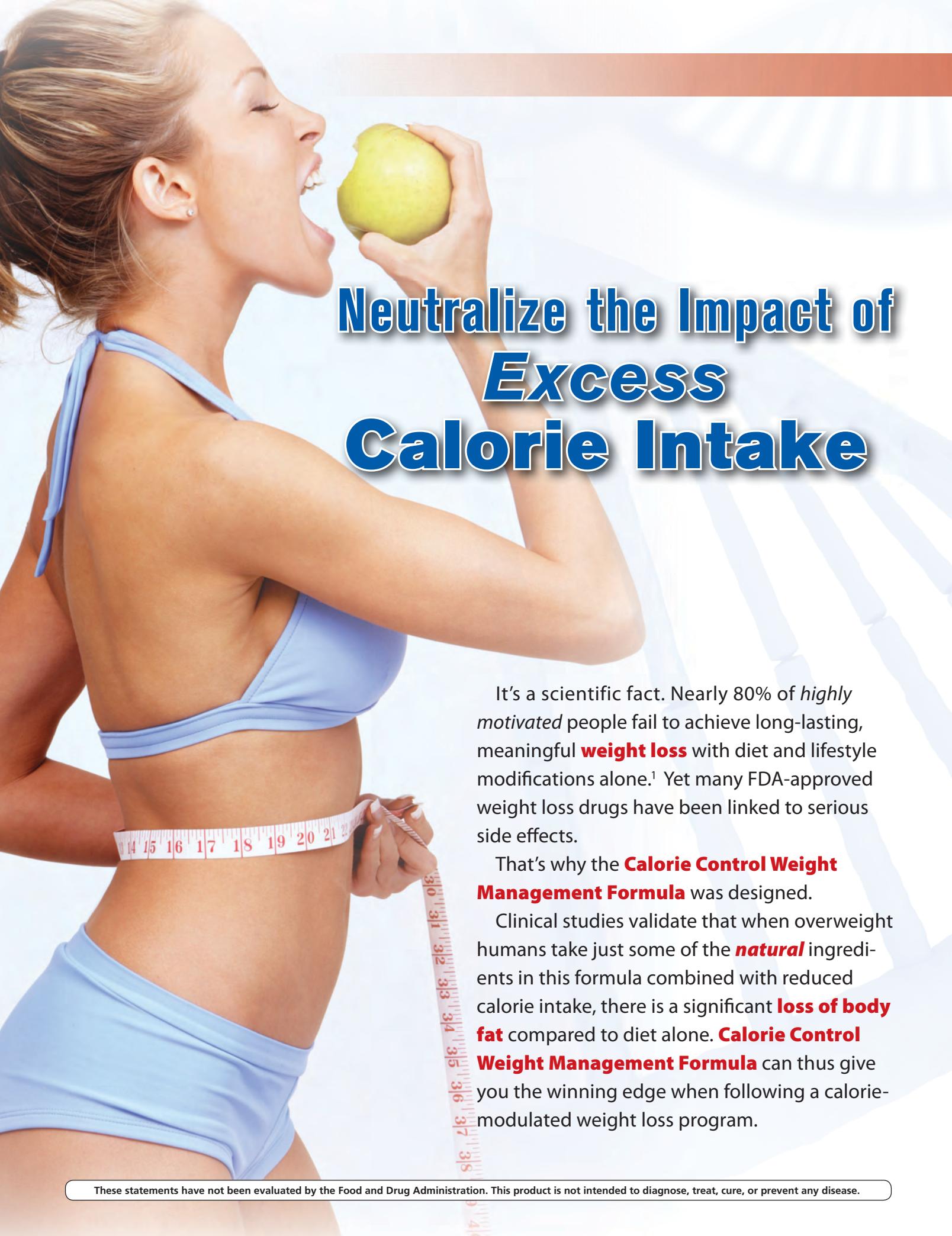
To order
Optimized Saffron with Satiereal®,
call **1-800-544-4440**
or visit www.LifeExtension.com

Satiereal® is a registered trademark of INORÉAL.
International patents pending.

The fact that Satiereal® induced significant reductions (100%) in the desire to snack, but with only moderate weight loss, is further support for the multi-pronged approach needed to effectively manage weight that has long been espoused by Life Extension®.

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. This product is not intended to diagnose, treat, cure, or prevent any disease.



Neutralize the Impact of Excess Calorie Intake

It's a scientific fact. Nearly 80% of *highly motivated* people fail to achieve long-lasting, meaningful **weight loss** with diet and lifestyle modifications alone.¹ Yet many FDA-approved weight loss drugs have been linked to serious side effects.

That's why the **Calorie Control Weight Management Formula** was designed.

Clinical studies validate that when overweight humans take just some of the **natural** ingredients in this formula combined with reduced calorie intake, there is a significant **loss of body fat** compared to diet alone. **Calorie Control Weight Management Formula** can thus give you the winning edge when following a calorie-modulated weight loss program.

Comprehensive Calorie Management

The **Calorie Control Weight Management Formula** is designed to be taken before the two heaviest daily meals to help neutralize the unwanted effects of caloric excess. Each scoop of this good-tasting powdered drink mix contains:

1. LuraLean® proprietary fiber that swells in the stomach after ingestion with water to help reduce calorie consumption. **LuraLean®** binds to **bile acids** in the small intestine and helps transport them out of the body.² These bile acids otherwise facilitate the digestion and assimilation of **dietary fat** into the bloodstream. **LuraLean®** also slows the rapid emptying of ingested food into the small intestine, thereby reducing the surge of **glucose** entering the bloodstream. **LuraLean®** works better than other fibers because its own enzymes have been removed, thus sparing it from degradation in the digestive tract.³⁻⁸ This enables **LuraLean®** to form a stable *viscous barrier* to help impede calorie absorption and maintain its sponge-like activity throughout the digestive tract. In placebo-controlled studies, **LuraLean®** has induced weight loss along with significant reductions in fasting lipid and post-meal glucose/insulin levels.^{9,10}

2. White kidney bean extract inhibits the *amylase* enzyme in the digestive tract. *Amylase* breaks down carbohydrates that are then absorbed into the bloodstream as glucose. **White kidney bean extract** has produced weight loss and abdominal fat reductions, along with significant reductions of triglycerides, in placebo-controlled trials.¹¹⁻¹³

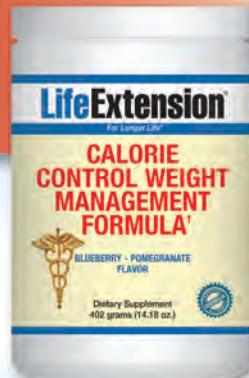
3. Irvingia gabonensis favorably regulates **leptin** to decrease appetite and facilitate triglyceride removal from adipocytes; inhibits **glycerol-3-phosphate dehydrogenase** to reduce the conversion of glucose into glycerol in adipocytes;¹⁴ and upregulates **adiponectin** to facilitate insulin sensitivity.¹⁵ **Irvingia** has demonstrated favorable weight loss results in placebo-controlled trials.

4. A proprietary green tea phytosome that absorbs much better into the bloodstream to boost *resting metabolic rate*.¹⁶ In a controlled clinical study, this green tea phytosome induced **30.1 pounds** of weight loss on average in 90 days when combined with a reduced calorie diet.¹⁷

Importance of Taking **Calorie Control Weight Management Formula** Before Heavy Meals

Once we accept the fact that weight loss requires more than diet and exercise alone, it becomes easy to understand the importance of taking the **Calorie Control Weight Management formula** before the two heaviest meals of the day. Each scoop provides:

Propolmannan (LuraLean®)	2,000 mg
White Kidney Bean (<i>Phaseolus</i>)	445 mg
<i>Irvingia gabonensis</i>	150 mg
Green Tea Phytosome	150 mg



The retail price for a one-month (60-serving) supply of **Calorie Control Weight Management** is \$56. If a member buys four bottles during **Super Sale**, the price is reduced to **\$32.40**. If eight bottles are purchased, the member price is slashed to only **\$29.70** per bottle. This is the lowest price the proprietary ingredients contained in this good-tasting powder formula have ever sold for!

Contains soybeans and tree nuts.

Contains corn.

LuraLean® is a registered trademark of AHD International, Inc. Integra-Lean® Irvingia is protected by U.S. Patent No. 7,537,790. Other patents pending. Phase2™ is used under license.

References

1. Ann Review Nutrition. 2001;21:323-41
2. Progress in Obesity Research. John Libbey & Company, Ltd., 1990;507-14.
3. Eur J Pharmaceut Biopharmaceut. 2009;72:453-62.
4. Agr Biol Chem. 1975;39(2):301-12.
5. U.S. Patent 3,856,945
6. U.S. Patent 3,928,322
7. U.S. Patent 3,973,008
8. U.S. Patent 3,767,424
9. Int J Obes. 1984;8(4):289-93.
10. Curr Ther Res. 1989 Nov;46(5):908-12.
11. Altern Med Rev. 2004 Mar;9(1):63-9.
12. Altern Ther Health Med. 2007 Jul-Aug;13(4):32-7.
13. Int J Med Sci. 2007 Jan 24;4(1):45-52.
14. Lipids Health Dis. 2008 Mar 31;7:12.
15. Lipids Health Dis. 2009 Mar 2:87.
16. Physiol Behav. 2010 Apr 26;100(1):42-6.
17. Integr Nutr. 2008;11(2):1-14.

To order **Calorie Control Weight Management Formula** today,
call **1-800-544-4440** or visit
www.LifeExtension.com/calcontrol

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. This product is not intended to diagnose, treat, cure, or prevent any disease.



AVOID ACCELERATED AGING with CARNOSINE

As we age, destructive **glycation** processes run rampant throughout our bodies.

Glycation involves a reaction of proteins with sugars that creates a variety of aging conditions ranging from wrinkled skin to cell structure damage.

Studies have shown that **carnosine** can inhibit **glycation**, while guarding the nervous system against toxic heavy metals.

A new laboratory study corroborates earlier research showing that **carnosine** can extend life span*.

Life Extension®'s Super Carnosine Caps provide **500 mg** of L-carnosine per capsule—a dose **10 times more potent** than most commercial brands. **Super Carnosine Caps** also contain **luteolin** and **benfotiamine** (lipid-soluble vitamin B1) to provide multifaceted protection against glycation and its deadly consequences.

The recommended daily dose of two capsules provides:

L-Carnosine	1000 mg
Benfotiamine	100 mg
Thiamine HCL	100 mg
Luteolin	8 mg

The retail price for a bottle of 90 500 mg **Super Carnosine Caps** is \$66. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$40.50** per bottle. Item # 01287

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



* *Rejuvenation Res.* 2010 Aug;13(4):453-7.

Note: Those who take the **Mitochondrial Energy Optimizer** are already consuming 1,000 mg of L-carnosine, along with benfotiamine.

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.



WELLNESS PROFILE

BY RONA CHERRY

JUDY COLLINS: LIVING AN ATHLETE'S LIFESTYLE



Judy Collins

She uses glucosamine sulfate with MSM for her arthritis, which she says is under control, and ginkgo for her memory.

More than 40 years have passed since singer/songwriter Judy Collins rose to fame in the coffeehouses of Greenwich Village alongside folk activists Bob Dylan, Joan Baez, and Pete Seeger. Since then, the two-time Grammy Award winner best known for her rendition of Joni Mitchell's "Both Sides Now" has recorded more than 40 albums, written nine books including a novel, and received an Academy Award nomination for co-directing "Antonia: A Portrait of a Woman."

Age has definitely not affected her energy or enthusiasm, and Collins, who turned 71 on May 1 last year, shows no signs of slowing down. This June, she wrapped up a six-week run at New York's Café Carlyle, released a new CD called "Paradise" from her own recording company, Wildflower Records, and published her first-ever children's book titled

Over the Rainbow. She still performs frequently, is working on a new book, and plans to do more song writing.

WELLNESS PROFILE



PRIVATE STRUGGLES

Collins, who released her first album in 1961 at age 22, credits her lengthy career, wondrously intact soprano voice, and energy to rigorous self-discipline. "My lifestyle is more and more like an athlete's," she said in an interview with *Life Extension* recently. "I take lots of vitamins, exercise, meditate, pray, and read on a regular basis. It's what I have to do in order to sing, perform (she does about 100 shows a year), do my traveling, my writing, and the other work I do when I'm not on the road."

Although her lovely voice radiates a sweet serenity, her private life has been full of trauma and heartbreak—a suicide attempt at 14, years of drug abuse and alcoholism (she's been sober for 30 years), tuberculosis, hepatitis, divorce from her college sweetheart, bulimia, and bouts of depression and panic attacks.

The toughest hurdle came in 1992 with the suicide of her 33-year old son and only child, Clark Taylor, who had been strug-

gling with some of Collins's same problems including substance abuse and depression. "I was beyond devastation," she told me, as we sat in her sprawling, four-bedroom New York apartment filled with family photos and paintings by friends, family, and Collins herself. "I wanted to die."

However, after years of therapy, meditation, and the support of her second husband, industrial designer Louis Nelson (whom she married in 1996 after 18 years together), she began to find her way out of the darkness. She has since become a mental-health advocate and speaks regularly about suicide and suicide prevention to survivor groups and mental health organizations.

NUTRITIONAL DISCIPLINE

"The voice is the only muscle in the body that does not deteriorate on its own unless it's abused," she says. "If you scream and laugh and drink and smoke and stay up all night and sing incorrectly, it's going to go. But if you don't, you

can sing until you fall over. I have to do the things that work for me and do them with determination."

Collins is particularly disciplined about her diet, almost as if she's in training. "I only eat what I'm supposed to be eating. Protein, vegetables, salad, and fruit, and that's it," she says. "I eat the whole, raw or cooked vegetables. I keep it pretty basic." She also does not eat sugar or grains and will not use flour of any kind except soy flour.

Collins has worked with New York internal medicine specialist Dr. Richard Ash for many years and is an outspoken advocate of vitamins and other nutritional supplements. "We have a lot of things in our atmosphere that are attacking us all the time so we have to build up from within," she says. "You've got to get the body to heal itself. So I pay attention."

To that end, she takes some 46 vitamins and other supplements a day, divided into morning and evening batches. Among them are quercetin, a potent antioxidant and anti-inflammatory that has a powerful effect on a variety of disease processes including asthma. "It's very important for the allergies I had," Collins explains. "I had a really extreme confrontation with asthma nearly 20 years ago. It was so bad I was losing my voice."

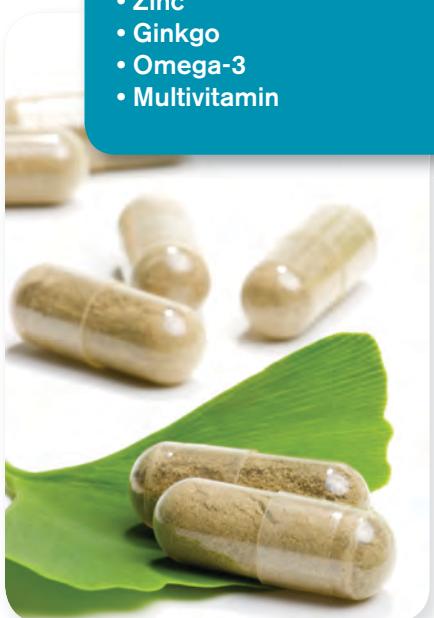
She also takes "tons" of vitamin C a day—up to 4,000 mg daily—and also does a vitamin C flush, which involves taking buffered vitamin C powder in high doses until it has the same cleansing effect as a colonic. "I do this once every six weeks," she says. "It doesn't have the invasive nature of a colonic and you feel such a lift from all that vitamin C running around in your body."

A strong believer in alternative medicine, Collins says acupuncture

WELLNESS PROFILE

Judy Collins's Supplement List

- Quercetin
- Vitamin B complex
- Vitamin C
- Vitamin D3
- Glucosamine Sulfate
- Coenzyme Q10
- Cranberry extract
- Acidophilus
- Calcium
- Magnesium
- Iron
- Zinc
- Ginkgo
- Omega-3
- Multivitamin



cured her of cystitis more than 30 years ago, and she takes a couple of cranberry pills every day to prevent the problem from recurring. She uses glucosamine sulfate with MSM for her arthritis, which she says is under control, and ginkgo for her memory. "I do the A, B, C, D vitamins, the complexes, coenzyme Q10. I keep my vitamin balance up."

Collins also goes for acupuncture once a month and has regular massages. Indeed, for the first year after her son died, she had a massage every day. "The massage helped me get back into my body and out of my grieving head," she has written.

AVID EXERCISER

As someone who has fought depression all her life, Collins is an avid exerciser (she loves to ski) and relies on vigorous exercise to boost her endorphins. Over the years, she's tried all different types of exercise ranging from the Royal Canadian Air Force exercises to yoga, aerobics, and swimming. Today, Collins exercises at home to get the endorphins going rather than go to a gym. She has a treadmill and stationary bike in her bedroom and spends 40 to 50 minutes a day exercising while watching television.

Even when she's on the road, Collins makes a point of exercising in her hotel after a concert or talk. "I get into town and I take a nap if I have time and then I'm off to rehearse and perform and have dinner. When I come back to the hotel, I work out by running around my hotel room and doing my exercise routine before I go to bed." Does exercising at night disrupt her sleep? "I sleep like a baby," she says.

SEEKING PEACE

Somewhere in her day, Collins finds time for meditation. She says she started meditating in her twenties, following the gurus of the times such as the Maharishi or Krishnamurti. She also went to



WELLNESS PROFILE



Judy's Musical Life

Although most of us think of Collins primarily as a guitar player, the legendary singer was a child prodigy at classical piano. Born in Seattle but raised in Colorado, she started lessons at the age of four and made her public debut with the Denver Symphony Orchestra, at age 13. But she found herself increasingly drawn to folk music and, by the time she was 16, had moved from the Steinway to guitar. She sang in Denver and Boulder clubs, then headed East to the coffeehouses and cafes of Greenwich Village.

In 1961, Elektra Records signed her and she released her first album "A Maid of Constant Sorrow." Her first gold album, "Wildflowers," led to Collins winning her first Grammy Award for Best Folk Performance in 1967. She won her second Grammy for her version of "Send in the Clowns," which was named Song of the Year in 1975.

A folk-music icon, Collins has included show tunes and standards, hymns, lullabies, and rock songs on the 40-plus albums she's released over the years. On her latest CD, "Paradise," she teams up with Stephen Stills and Joan Baez on two tracks and there's a new song by Jimmy Webb called "Gauguin" about the painter. She also just released the classic "Over the Rainbow" on a CD that's included with a new children's picture book of the same name from the Peter Yarrow Books imprint.

yoga classes in New York. "I knew in my heart I had to find a way into a steady practice of meditation," she says.

In her forties, she was introduced to Self-Realization Fellowship (SRF), a meditation form that includes deep breathing and yoga, by Dr. Antonia Brico, with whom she had studied classical piano from the ages of 9 to 15. Dr. Brico, who as the first woman to conduct the New York Philharmonic became the subject of a film that Collins made in 1974, told her about Paramahansa Yogananda, SRF's founder. Soon Collins became a student of his practice of meditation. "I'm very into SRF," Collins says. "I try for twice a day." Collins says that meditation not only calms her, but helps her focus. "It provides an emotional stability for me that I really need," she says.

WHAT'S AHEAD

Retirement doesn't seem to be an option for Collins. She talked excitedly about upcoming concerts and performances in Europe, with "lots of press," including the United Kingdom's Glastonbury Festival ("It's sort of like their Woodstock—you know, 100,000 people in the mud"). After concerts in England, she would do a show in Paris, before returning to the US to do concerts throughout the nation, including one with Crosby, Stills and Nash and Richie Havens at AARP's National Event & Expo this fall in Florida. "I also plan to work on my new book (a memoir) and dig back into my songwriting," she said. "Exciting things are in front of me." ●

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



All the K...One a Day

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

The retail price for a bottle containing **90 softgels** (three-month supply) is \$26. If a member buys four bottles during **Super Sale**, the price is reduced to just **\$15.53 per bottle**.

Item # 01224

Super K formula provides in just one daily softgel:

Vitamin K1	1000 mcg
Vitamin K2 (MK-4)	1000 mcg
Vitamin K2 (MK-7)	100 mcg

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 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 (45 mcg a day) of vitamin K2 in the long-acting MK-7 form for the purpose of stabilizing your INR levels and also protecting your body against long-term vitamin K deficit. Do not initiate any form of vitamin K supplementation without full cooperation of your treating doctor, as your doctor may need to increase your dose of warfarin to compensate for the vitamin K you supplement with. Life Extension provides several forms of low-dose vitamin K for physician consideration.

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

References:

1. *Vitam Horm*. 2008;78:393-416.
2. *Nutrition*. 2006 Jul-Aug;22(7-8):845-52.
3. *Calcif Tissue Int*. 1996 Nov;59(5):352-6.
4. *Z Kardiol*. 2001;90 Suppl 3:57-63.
5. *Atherosclerosis*. 2008 Jul 19.
6. *J Bone Miner Metab*. 2008;26(3):260-4.
7. *Am J Clin Nutr*. 2008 Apr;87(4):985-92.
8. *J Biol Regul Homeost Agents*. 2008 Jan-Mar;22(1):35-44.
9. *Blood*. 2007 Apr 15;109(8):3279-83.



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 blood testing is an essential component of any program designed to attain optimal health and longevity, *Life Extension*® offers this innovative and convenient service at a very affordable price. Not only is comprehensive blood testing an important step in safeguarding your health, it is a simple process from virtually anywhere in the United States.

Five Easy Steps:

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.
2. After your order is placed, you will be mailed either a requisition form to take to your local LabCorp Patient Service Center or a Blood Draw Kit; whichever is applicable (Please note: If a blood draw kit is used, an additional local draw fee may be incurred.)
3. Have your blood drawn.
4. Your blood test results will be mailed 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 1100 West Commercial Blvd, Ft. Lauderdale, FL, 33309. We're located at Commercial Blvd and Powerline Road, just west of I-95. For more information or directions call 954-766-8144.

Blood Testing

The Ultimate Information

MOST POPULAR PANELS

Life Extension Member Pricing

SUPER SALE SPECIALS: Two Tests under \$100 EVERYONE should have!

OMEGA SCORE™** (LCOMEGA)

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.

\$99
LIMITED TIME OFFER !

COQ10* (COENZYME Q10) (LC120251)

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.

\$75
LIMITED TIME OFFER !

COMPREHENSIVE PANELS

MALE WEIGHT LOSS PANEL (LCWLM)*

CBC/Chemistry Profile	DHEA-S	\$299
Insulin	PSA (prostate-specific antigen)	
Free Testosterone	Total Testosterone	
Estradiol	TSH	
Free T3	Free T4	
C-Reactive Protein (high sensitivity)		

FEMALE WEIGHT LOSS PANEL (LCWLF)*

CBC/Chemistry Profile	DHEA-S	\$299
Progesterone	Insulin	
Free Testosterone	Total Testosterone	
Estradiol	TSH	
Free T3	Free T4	
C-Reactive Protein (high sensitivity)		

MALE LIFE EXTENSION PANEL (LC322582)

CBC/Chemistry Profile	DHEA-S	\$269
Homocysteine	TSH for thyroid function	
Free Testosterone	Total Testosterone	
Estradiol		
PSA (prostate-specific antigen)		
C-Reactive Protein (high-sensitivity)		

MALE HORMONE ADD-ON PANEL (LCADD)*

Pregnenolone and Dihydrotestosterone (DHT)
To provide an even more in-depth analysis of a man's hormone status, Life Extension has created this panel as an addition 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.

FEMALE LIFE EXTENSION PANEL (LC322535)

CBC/Chemistry Profile	DHEA-S	\$269
Estradiol	Homocysteine	
Progesterone	TSH for thyroid function	
Free Testosterone	Total Testosterone	
C-Reactive Protein (high-sensitivity)		

FEMALE HORMONE ADD-ON PANEL (LCADD)*

Pregnenolone and Total Estrogens
To provide an even more in-depth analysis of a woman's hormone status, Life Extension has created this panel as an addition 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.

LIFE EXTENSION THYROID PANEL (LC304131)

TSH, T4, Free T3, Free T4. \$75

MALE HORMONE RE-TEST PROFILE (LCRTM)*

\$275
CBC/Chemistry Profile, DHEA-S, Dihydrotestosterone (DHT), Estradiol, PSA, Pregnenolone, Total and Free Testosterone, and TSH. Continual monitoring of hormone levels is necessary for men seeking to maintain optimal blood level values.

FEMALE HORMONE RE-TEST PROFILE (LCRTF)*

\$250
CBC/Chemistry Profile, DHEA-S, Total Estrogen, Pregnenolone, Total and Free Testosterone, Progesterone, and TSH. Continual monitoring of hormone levels is necessary for women seeking to maintain optimal blood level values.

THE CBC/CHEMISTRY PROFILE (LC381822)

\$35

OVER 40 PARAMETERS TESTED

CARDIOVASCULAR RISK PROFILE

Total Cholesterol	Cholesterol/HDL Ratio
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	Hemoglobin
Polys (Absolute)	Hematocrit
Lymphs (Absolute)	MCV
Monocytes (Absolute)	MCH
Eos (Absolute)	MCHC
Baso (Absolute)	Polynucleated Cells
RDW	

BLOOD MINERAL PANEL

Calcium	Sodium
Potassium	Chloride
Phosphorus	Iron

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

GENERAL HEALTH

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 (25OH) (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.

CYTOKINE PANEL (LCCYT)*

\$399

Includes TNF-alpha, IL-6, IL-1 beta and IL-8. Cytokines are proteins that modulate the inflammatory response. This panel is used to identify elevated levels of specific cytokines.

NEW LOW PRICE

* 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.

** This test is packaged as a kit, requiring a finger stick performed at home.



MOST POPULAR SINGLE TESTS

Life Extension Member Pricing

<input type="radio"/> HORMONES		
<input type="radio"/> CORTISOL (LC004051)	\$39	
This test is to measure adrenal function.		
<input type="radio"/> ADRENOCORTICOTROPIC HORMONE (ACTH)* (LC004440)	\$91.50	
A pituitary function test useful in evaluating adrenocortical dysfunction.		
<input type="radio"/> DHEA-SULFATE (LC004697)	\$61	
This test shows if you are taking the proper amount of DHEA. This test normally costs \$100 or more at commercial laboratories.		
<input type="radio"/> DIHYDROTESTOSTERONE (DHT)* (LC500142)	\$99	
Measures serum concentrations of DHT.		
<input type="radio"/> ESTRADIOL (LC004515)	\$33	
For men and women. Determines the proper amount in the body.		
<input type="radio"/> INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN 3 (IGFBP3) (LC140152)	\$47	
Elevated levels in hypertensive individuals have been associated with a nine-fold increase of carotid arteriosclerosis.		
<input type="radio"/> INSULIN FASTING* (LC004333)	\$42	
Can predict those at risk of diabetes, obesity, and heart and other diseases.		
<input type="radio"/> PREGNENOLONE* (LC140707)	\$116	
Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing's syndrome.		
<input type="radio"/> PROGESTERONE (LC004317)	\$55	
Primarily for women. Determines the proper amount in the body.		
<input type="radio"/> SEX HORMONE BINDING GLOBULIN (SHBG) (LC082016)	\$33	
This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.		
<input type="radio"/> SOMATOMEDIN C (IGF-1) (LC010363)	\$75	
Indicates growth hormone secretion levels. Low levels have been associated with atherosclerosis as well as all-cause mortality.		
<input type="radio"/> TOTAL AND FREE TESTOSTERONE (LC140103)	\$99	
Determines whether testosterone replacement should be considered as a therapy for depression, abdominal obesity, low energy, poor mental performance, or loss of libido.		
<input type="radio"/> URINARY 2/16 ESTROGEN METABOLITE RATIO (LCU73000)	\$128	
This ratio is relevant as a risk factor for estrogen-sensitive diseases including breast and cervical cancers, osteoporosis, and recurrent respiratory papillomatosis.		
<input type="radio"/> CARDIAC RISK		
<input type="radio"/> Lp-PLA2 (PLAC TEST)* (LC141275)	\$125	
This test is used to aid in predicting risk for coronary heart disease, and ischemic stroke associated with atherosclerosis. Lp-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.		
<input type="radio"/> C-REACTIVE PROTEIN (HIGH-SENSITIVITY) (LC120766)	\$42	
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.		
<input type="radio"/> APOLIPOPROTEIN ASSESSMENT (APO A1 + APO B + RATIO) (LC216010)	\$55	
This ratio correlates with risk of coronary artery disease and is useful in the presence of borderline elevations of cholesterol.		
<input type="radio"/> FIBRINOGEN* (LC001610)	\$31	
High levels of this blood-clotting factor increase the risk of heart attack and stroke.		
<input type="radio"/> HOMOCYSTEINE (LC706994)	\$64	
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 TMG and vitamin B6.		
<input type="radio"/> VAP™ TEST (LC804500)	\$90	
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.		
<input type="radio"/> MALE HEALTH		
<input type="radio"/> PSA (PROSTATE-SPECIFIC ANTIGEN) (LC010322)	\$31	
Can provide an early warning sign for prostate disorders and possible cancer.		
<input type="radio"/> FREE-PSA (INCLUDES TOTAL PSA)* (LC480780)	\$61	
Recommended to determine if an elevated PSA is indicative of prostate cancer.		
<input type="radio"/> BONE HEALTH		
<input type="radio"/> OSTEOCALCIN* (LC010249)	\$91	
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.		
<input type="radio"/> DPD CROSS LINK URINE TEST (LC511105)	\$79	
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.		

For non-member prices
call 1-800-208-3444

This is NOT a complete listing of LE blood test services. Call 1-800-208-3444 for additional information.

**ORDER LIFE-SAVING
BLOOD TESTS
FROM VIRTUALLY
ANYWHERE IN THE US!**

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:

LifeExtension
NATIONAL DIAGNOSTICS, INC.

1100 West Commercial Blvd.,
Ft. Lauderdale, FL 33309

Phone your order to: 1-800-208-3444

Fax your order to: 1-866-728-1050

Products

AMINO ACIDS

Acetyl-L-Carnitine
Acetyl-L-Carnitine-Arginate
Branched Chain Amino Acids
D, L-Phenylalanine Capsules
GABA Powder
Glycine Capsules
Glycine Powder
Arginine Capsules
L-Arginine Free Base Powder
Arginine/L-Ornithine Capsules
L-Carnitine Capsules
L-Cysteine Capsules
L-Glutathione, L-Cysteine & C
L-Glutamine Capsules
L-Glutamine Powder
L-Lysine Capsules
L-Lysine Powder
L-Tyrosine Tablets
Mega L-Glutathione Capsules
N-Acetyl Cysteine Capsules
Optimized Carnitine with GlycoCarn®
PharmaGABA
Super Carnosine Capsules
Taurine Capsules
Tryptopure® Tryptophan
(Optimized) Tryptopure® Plus

BONE & JOINT HEALTH

ArthroMax™ with Theaflavins
Bone-Up™
Bone Restore™
Bone Strength Formula w/KoAct™
Chondroitin Sulfate
Chondrox
Fast Acting Joint Formula
Glucosamine Chondroitin Capsules

BRAIN HEALTH

Acetyl-L-Carnitine
Acetyl-L-Carnitine-Arginate
CDP Choline Capsules
Cognitex with NeuroProtection Complex
Cognitex with Pregnenolone &
NeuroProtection Complex
Cognitex Basics
DMAE
DMAE-Ginkgo
Ginkgo Biloba Certified Extract™
Huperzine A
Lecithin with B5 and BHA
Lecithin Granules
Methylcobalamin Lozenges
Optimized Ashwagandha Extract
Phosphatidylserine Capsules
Rhodiola Extract
Super Ginkgo Extract
Vinpocetine

DIGESTIVE

Agave Digestive-Immune Support
Bromelain Powder
Carnosothe w/PicroProtect
Digest RC™
Enhanced Super Digestive Enzymes
(also available with Probiotics)
Florastor
Intact Digest
Life Flora™
Natural EsoGuard
N-Zimes™
Pancreatin
Primal Defense
Regimint™
Saccharomyces Boulardii+mos

DURK AND SANDY PRODUCTS

Blast™
Dual-C
Inner Power™
Memory Upgrade

EYE CARE

Bilberry Extract
Blackcurrant Freeze Dried Extract
Brite Eyes III

Overcast Polarized Sunglasses
Solarshield Sunglasses
Super Zeaxanthin with Lutein &
Meso-Zeaxanthin and C3G
(Plus Astaxanthin also available)
Vision Optimizer

FIBER

Apple Pectin Powder
Fiber Food
Hi-Lignan® Nutri-Flax®
SlimStyles® PGX
WellBetX PGX® Soluble Fiber Blend

FOOD

Asian Cruciferous Vegetable Soup
Cruciferous Vegetable Soup

HAIR CARE

Dr. Proctor's Advanced Hair Formula
Dr. Proctor's Shampoo
Life Extension Shampoo and Conditioner
Super-Absorbable Tocotrienols

HEART HEALTH

Advanced Lipid Control
Cho-Less
D-Ribose Capsules
D-Ribose Powder
Endothelial Defense™ with
Full-Spectrum Pomegranate™
Fibrinogen Resist
Forskolin
Homocysteine Resist
Low Dose Aspirin (Enteric Coated)
Natural BP Management
Peak ATP® with GlycoCarn®
Policosanol
Red Yeast Rice
Super Absorbable CoQ10™ with d-Limonene
Super Omega-3 EPA/DHA with Sesame
Lignans & Olive Fruit Extract
Super Ubiquinol CoQ10
Super Ubiquinol CoQ10 with Enhanced
Mitochondrial™ Support
Strynol™
Theaflavin Standardized Extract
TMG Powder
TMG Tablets

HERBAL/PHYTO PRODUCTS

Artichoke Leaf Extract
Astaxanthin
Berry Complete
Blackcurrant Juice Concentrate
Blueberry Extract
Blueberry Extract w/Pomegranate
Butterbur Extract w/Standardized
Rosmarinic Acid
Calcium D-Glucarate
Cilantro Herbal Extract
Citrus Bioflavonoid
Enhanced Berry Complete with RZD™ Acai
Grapeseed Extract with Resveratrol &
Pterostilbene
Huperzine A with Natural Vitamin E
Kyolic® Garlic Formula 105
Kyolic® Reserve
Lycopene
Mega Green Tea Extract
Mega Green Tea Extract (Decaffeinated)
Mega Lycopene
Mega Silymarin with Isosilybin B
Nutrim
Optimized Ashwagandha Extract
Pomegranate Extract
(Full-Spectrum) Pomegranate™
Pomegranate Juice Concentrate
ProGreens®
Pure-Gar™
Pycnogenol
Optimized Quercetin
Resveratrol with Synergistic Grape-Berry Actives

Rhodiola Extract
Rosmarinic Acid Extract
Silymarin
SODzyme™ with Glisodin®
Stevia Extract
Super Bio-Curcumin®
Super Curcumin with Bioperine®
Super Ginkgo Extract
Triple Action Cruciferous Vegetable Extract
Venotone
Whole Grape Extract

HORMONES

7-Keto® DHEA
DHEA
DHEA Complete
GH Pituitary Support Day Formula
GH Pituitary Support Night Formula
Melatonin
Melatonin Timed Release
Natural Estrogen with Pomegranate Extract
Pregnenolone
ProFem Cream
Pure IGF
Super Miraforte with Standardized Lignans

IMMUNE ENHANCEMENT

Agave Digestive-Immune Support
AHCC® (Active Hexose Correlated Compound)
Buffered Vitamin C Powder
Echinacea
Enhanced Life Extension Whey Protein
i26 Hyperimmune Egg
Immune Protect with PARACTIN®
Lactoferrin
Lifeshield® Immunity™
Maitake SX-Fraction
Norwegian Shark Liver Oil
Primal Defense™
ProBoost™ Thymic Protein A
Pure Gar™
Sambu® Guard
Theralac Capsules
Thymic Immune Factors
Ultimate Flora Advanced Immunity
Vitamin C with Dihydroquercetin
Zinc Lozenges with Vitamin C

INFLAMMATORY REACTIONS

Arthro-Immune Joint Support
ArthroMax™ with Theaflavins
Barlean's Kids DHA
Boswellia
Boswellia™ Topical Cream
Bromelain (Specially-coated)
Coromega Kids Brain and Body (DHA)
DHA 240
Emulsified Norwegian Cod Liver Oil
Emulsified Super Twin EPA/DHA
Fast Acting Joint Formula
5-LOXIN®
Mega EPA/DHA
Mega GLA with Sesame Lignans
MSM
Natural Relief 1222™ Cream
PhosphOmega™ Krill Oil
Serraflazyme
SODzyme™ with Glisodin® and Wolfberry
Super Omega-3 EPA/DHA with Sesame
Lignans & Olive Fruit Extract
Tart Cherry
Udo's Choice Oil
Zyflamend Easy

LIVER HEALTH

Branch Chain Amino Acids
N-Acetyl Cysteine
Optimized Milk Thistle (Silymarin)
PhosChol (Nutrasal)
SAMe
Silymarin

MINERALS

Biosil
Bone Restore
Bone Strength Formula w/KoAct™
Bone-Up™

Products

Boron Capsules
Calcium Citrate with D3
Chromium Ultra
Copper
Dr. Strum's Intensive Bone Formula
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™
Selenium
Se-Methylselenocysteine
Strontium
Vanadyl Sulfate
Zinc/Vitamin C Lozenges

MISCELLANEOUS

Blood Pressure Monitor Arm Cuff Medium
Cell Sensor Gauss Meter™
(Nutribase) CRWay Edition
Advanced Dietary Software
Empty Gelatin Capsules
The Capsule Filler Machine
The Pill Cutter and Grinder

MITOCHONDRIAL SUPPORT

Acetyl-L-Carnitine
Acetyl-L-Carnitine-Arginate
Mitochondrial Basics w/BioPQQ™
Mitochondrial Energy Optimizer w/BioPQQ™
Optimized Carnitine with GlycoCarn®
Super Absorbable CoQ10™ with d-Limonene
Super Alpha Lipoic Acid with Biotin
Super R-Lipoic Acid
Super Ubiquinol CoQ10 with Enhanced Mitochondrial™ Support

MOOD RELIEF

L-Theanine
5 HTP
Natural Stress Relief
Optimized TryptoPure™ Plus
Stabilium® 200
SAMe
St. John's Wort Extract
Tryptopure™ L-Tryptophan

MOUTH CARE

Advanced Oral Hygiene
Dr. Tung's Tongue Cleaner
Life Extension Mouthwash w/Pomegranate
Life Extension Toothpaste
MistOral III™ with CoQ10

MULTIVITAMIN

Children's Formula Life Extension Mix
Comprehensive Nutrient Pack
Life Extension Booster
Life Extension Mix™ Capsules
Life Extension Mix™ Powder
Life Extension Mix™ Tablets
Life Extension Mix™ w/o Copper Capsules
Life Extension Mix™ w/o Copper Tablets
Life Extension Mix™ w/Extra Niacin
Life Extension Mix™ w/Extra Niacin w/o Copper
Life Extension Mix™ w/Stevia Powder
Life Extension Mix™ w/Stevia w/o Copper Powder
Life Extension One-Per-Day
Life Extension Two-Per-Day
Super Booster Softgels w/Advanced K2 Complex
Vital Greens Mix

PET CARE

Life Extension Cat Mix
Life Extension Dog Mix

PROSTATE & URINARY HEALTH

BetterWOMAN®
Optimized Cran-Max® with UTIRose™
5-LOXIN®

(Water-Soluble) Pumpkin Seed Extract
Super Saw Palmetto with Beta-Sitosterol
Super Saw Palmetto/Nettle Root Formula
w/Beta-Sitosterol
Ultra Natural Prostate Formula

SKIN CARE

Anti-Aging Mask
Anti-Glycation Serum
Antioxidant Rejuvenating Foot Cream
Antioxidant Rejuvenating Foot Scrub
Antioxidant Rejuvenating Hand Cream
Antioxidant Rejuvenating Hand Scrub
Anti-Redness & Blemish Lotion
Cellulite Suppress™ Formula
Corrective Clearing Mask
Derma Whey
Dual-Action MicroDerm Abrasion
Essential Plant Lipids Reparative Serum
Face Master® Platinum
Face Rejuvenating Antioxidant Cream
Enhanced FernBlock® with Sendara™
Fine Line-Less
Hair Suppress Formula
Healing Formula All-in-One Cream
Healing Mask
Hyaluronic Facial Moisturizer
Hydrating Anti-oxidant Face Mist
Hydroderm®
Lavilin Underarm Deodorant
Life Extension Sun Protection Spray
Lifting & Tightening Complex
Melatonin Cream
Mild Facial Cleanser
NaPCA w/Aloe Vera
Neck Rejuvenating Antioxidant Cream
New Face Solution
Peel Off Cleansing Mask
Pigment Correcting Cream
(Ultra) Rejuvenex®
Rejuvenex® Body Lotion
RejuvenerX® Factor
Rejuvenating Serum
Skin Lightening Serum
Skin Restoring Ceramides w/Lipowheat™
Skin Stem Cell Serum
Total Sun Protection Cream
Triple Action Under Eye Rejuvenator
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 K Healing Cream

SOY

Natural Estrogen w/Pomegranate
Soy Power Powder
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
Chlorella
Chlorophyllin w/Zinc
Coriolus Versicolor Super Strength
CR Mimetic Longevity Formula
Derma-Vits™
Cinsulin® w/InSea™ and Crominex® 3+
EDTA
(European Leg Solution) Diosmin 95
Fem Dophilus
Femmenessence MacaPause®
GlucoFit™
Ideal Bowel Support 299V

Lustre™
Maitake SX-Fraction™
Menopause Solutions
Migra-eeze™
Natural Female Support
Organic Total Body Cleanse
Pecta-Sol®
Potassium Iodide
PQQ Caps with BioPQQ™
Prelox® Natural Sex for Men®
Pyridoxal 5' - Phosphate
Rosmarinic Acid Extract

SPORTS PERFORMANCE

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

VITAMINS

Ascorbic Acid Powder
Ascorbyl Palmitate Capsules
B1
B2
B12
Beta-Carotene
Biotin Capsules
Biotin Powder
Buffered Vitamin C Powder
Complete B Complex
Essential Fat-Soluble Nutrient
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
Tocotrienols w/Sesame Lignans
(Interplexus) Vitamin A Nutrisorb
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

Alli® Refill Pack
Belly Slim & Tone
Calorie Control Weight Management Formula
7-Keto DHEA
DHEA Complete
Fucoxanthin Slim™
HCA
Integra-Lean® Irvingia
LuraLean® Caps Special Propolmannan Particle Size
Optimized Irvingia w/Phase 3™ Calorie Control Complex
Optimized Saffron with Satireal®
Life Mix
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

Buyers Club Order Form

SUPER SALE SAVINGS ON ALL PRODUCTS
To order call: 1-954-766-8433 or 1-800-544-4440

No.		Retail	Member Price	Qty	Total
A					
00449	ACETYL-L-CARNITINE - 500 mg, 100 caps	\$56.00	\$42.00		
	ACETYL-L-CARNITINE - 4 bottles of 100 caps	186.64	139.98		
00788	ACETYL-L-CARNITINE ARGINATE - 100 caps	59.00	44.25		
	ACETYL-L-CARNITINE ARGINATE - 4 bottles of 100 caps	203.96	152.97		
01308	ADVANCED LIPID CONTROL - 60 veg. caps	30.00	22.50		
	ADVANCED LIPID CONTROL - 4 bottles of 60 veg. caps	108.00	81.00		
01300	ADVANCED ORAL HYGIENE - 60 veg. mint lozenges	20.00	15.00		
	ADVANCED ORAL HYGIENE - 4 bottles of 60 veg. mint lozenges	72.00	54.00		
01417	AGAVE DIGESTIVE-IMMUNE SUPPORT - 360 grams of powder	30.00	22.50		
	AGAVE DIGESTIVE-IMMUNE SUPPORT - 4 bottles of powder	108.00	81.00		
00681	AHCC - 500 mg, 30 caps	48.98	36.74		
	AHCC - 4 bottles of 30 caps	174.20	130.65		
46925	ALLI® REFILL PACK - 60 mg, 120 caps	69.95	58.00		
00457	(SUPER) ALPHA-LIPOID ACID W/BIOTIN - 250 mg, 60 caps	37.00	27.75		
	(SUPER) ALPHA-LIPOID ACID w/BIOTIN - 4 bottles of 60 caps	128.00	96.00		
01440	ANTI-ALCOHOL ANTIOXIDANTS W/HEPATOPRO - 100 caps	26.00	19.50		
	ANTI-ALCOHOL ANTIOXIDANTS W/HEPATOPRO - 4 bottles of 100 caps	92.00	69.00		
00105	APPLE PECTIN POWDER - 227 grams of powder	14.75	11.06		
	APPLE PECTIN POWDER - 4 bottles of powder	55.00	41.25		
01012	ARGININE CAPS - 800 mg, 200 caps	26.50	19.88		
	ARGININE CAPS - 4 bottles of 200 caps	93.00	69.75		
01039	ARGININE/ORNITHINE CAPS - 500/250 mg, 100 caps	16.00	12.00		
	ARGININE/ORNITHINE CAPS - 4 bottles of 100 caps	58.00	43.50		
00038	ARGININE/ORNITHINE POWDER - 150 grams of powder	22.95	17.21		
	ARGININE/ORNITHINE POWDER - 4 bottles of powder	76.00	57.00		
01025	(L)-ARGININE FREE-FORM POWDER - 100 grams of powder	15.98	11.99		
	(L)-ARGININE FREE-FORM POWDER - 4 bottles of powder	57.24	42.93		
01317	ARTHROMAX™ w/THEAFLAVINS - 120 veg. caps	44.00	33.00		
	ARTHROMAX™ w/THEAFLAVINS - 4 bottles of 120 veg. caps	160.00	120.00		
01404	ARTHRO-IMMUNE JOINT SUPPORT - 60 veg. caps	30.00	22.50		
	ARTHRO-IMMUNE JOINT SUPPORT - 4 bottles of 60 veg. caps	104.00	78.00		
00919	ARTICHOKE LEAF EXTRACT - 500 mg, 180 veg. caps	28.00	21.00		
	ARTICHOKE LEAF EXTRACT - 4 bottles of 180 veg. caps	101.52	76.14		
00086	(SUPER) ASCORBATE C POWDER - 8 oz of powder	26.99	20.24		
	(SUPER) ASCORBATE C POWDER - 4 bottles of powder	99.48	74.61		
00080	ASCORBIC ACID POWDER - 16 oz of powder vitamin C	38.00	28.50		
	ASCORBIC ACID POWDER - 4 bottles of powder vitamin C	139.72	104.79		
00082	ASCORBYL PALMITATE CAPSULES - 500 mg, 100 caps	22.50	16.88		
	ASCORBYL PALMITATE CAPSULES - 4 bottles of 100 caps	80.00	60.00		
00888	(OPTIMIZED) ASHWAGANDHA EXTRACT - 60 veg. caps	10.00	7.50		
	(OPTIMIZED) ASHWAGANDHA EXTRACT - 4 bottles of 60 veg. caps	36.00	27.00		
01066	(LOW DOSE) ASPIRIN ENTERIC COATED - 81 mg, 300 tablets	6.00	4.50		
	(LOW DOSE) ASPIRIN ENTERIC COATED - 4 bottles of 300 tablets	21.32	16.00		
00708	ASTAXANTHIN - 2 mg, 30 softgels	10.25	7.69		

* These products are not 25% off retail price.

SUB-TOTAL OF COLUMN 1

FEBRUARY 2011

No.		Retail	Member Price	Qty	Total
B					
01040	BELLY SLIM & TONE - 6 fl oz	\$42.00	\$31.50		
	BELLY SLIM & TONE - 4 bottles of 6 fl oz	152.00	114.00		
00920	BENFOTIAMINE W/ THIAMINE - 100 mg, 120 caps	19.95	14.96		
	BENFOTIAMINE W/ THIAMINE - 4 bottles of 120 caps	74.40	55.80		
00925	(MEGA) BENFOTIAMINE - 250 mg, 120 veg. caps	30.00	22.50		
	(MEGA) BENFOTIAMINE - 4 bottles of 120 veg. caps	108.00	81.00		
01206	BERRY COMPLETE - 30 veg. caps	21.00	15.75		
	BERRY COMPLETE - 4 bottles of veg. caps	74.68	56.00		
01406	(ENHANCED) BERRY COMPLETE w/RZD™ ACAI - 60 veg. caps	29.00	21.75		
	(ENHANCED) BERRY COMPLETE w/RZD™ ACAI - 4 bottles of veg. caps	104.00	78.00		
00664	BETA-CAROTENE - 25,000 IU, 100 softgels	10.98	8.24		
	BETA-CAROTENE - 4 bottles of 100 softgels	39.32	29.49		
00653	BETTERWOMAN - 40 caps	40.00	30.00		
	BETTERWOMAN - 4 bottles of 40 caps	152.00	114.00		
01073	BILBERRY EXTRACT - 100 mg, 100 veg. caps	28.00	21.00		
	BILBERRY EXTRACT - 4 bottles of 100 veg. caps	100.00	75.00		
*01006	BIOSIL™ - 5 mg, 30 veg. caps	18.95	15.16		
*01007	BIOSIL™ - 30 fl ml	29.99	23.99		
00102	BIOTIN CAPSULES - 600 mcg, 100 caps	7.50	5.63		
	BIOTIN CAPSULES - 4 bottles of 100 caps	26.00	19.50		
00145	BIOTIN POWDER - 30 grams of powder	12.50	9.38		
	BIOTIN POWDER - 4 bottles of powder	44.00	33.00		
01037	BLACKCURRANT FREEZE DRIED EXTRACT - 60 veg. caps	21.95	16.46		
01034	BLACKCURRANT JUICE CONCENTRATE - 12 fl. oz	17.95	13.46		
01008	BLAST™ - 600 grams of powder	26.95	20.21		
70000	BLOOD PRESSURE MONITOR-ARM CUFF (medium)	99.95	64.97		
70001	BLOOD PRESSURE MONITOR-WRIST (travel size)	69.95	45.47		
01214	BLUEBERRY EXTRACT - 60 veg. caps	22.50	16.88		
	BLUEBERRY EXTRACT - 4 bottles of 60 veg. caps	80.00	60.00		
01438	BLUEBERRY EXTRACT w/ POMEGRANATE - 60 veg. caps	30.00	22.50		
	BLUEBERRY EXTRACT w/ POMEGRANATE - 4 bottles of 60 veg. caps	108.00	81.00		
01506	(DR. STRUM'S INTENSIVE) BONE FORMULA - 300 veg. caps	56.00	42.00		
	(DR. STRUM'S INTENSIVE) BONE FORMULA - 4 bottles of 300 veg. caps	200.00	150.00		
00811	BONE RESTORE - 150 caps	22.50	16.88		
	BONE RESTORE - 4 bottles of 150 caps	78.00	58.50		
01211	BONE STRENGTH FORMULA w/KOACT™ - 120 caps	42.00	31.50		
	BONE STRENGTH FORMULA w/KOACT™ - 4 bottles of 120 caps	152.00	114.00		
00313	BONE-UP® - 240 caps (hydroxyapatite complex)	24.95	18.71		
	BONE-UP® - 4 bottles of 240 caps	90.00	67.50		
01379	BOOSTER - 60 softgels	48.00	36.00		
	BOOSTER - 4 bottles of 60 softgels	176.00	132.00		
01380	(SUPER) BOOSTER w/ADVANCED K2 COMPLEX - 60 softgels	42.00	31.50		
	(SUPER) BOOSTER w/ADVANCED K2 COMPLEX - 4 bottles of 60 softgels	152.00	114.00		
00621	BORON CAPS - 3 mg, 100 caps	5.95	4.46		
	BORON CAPS - 4 bottles of 100 caps	21.00	15.75		
00202	BOSWELLA - 100 caps	38.00	28.50		
	BOSWELLA - 4 bottles of 100 caps	120.00	90.00		
00258	BOSWELLA TOPICAL CREAM - 4 oz jar	15.00	11.25		
	BOSWELLA TOPICAL CREAM - 4 jars	52.00	39.00		
00253	BRANCHED CHAIN AMINO ACIDS - 90 caps	19.50	14.63		
	BRANCHED CHAIN AMINO ACIDS - 4 bottles of 90 caps	68.00	51.00		

SUB-TOTAL OF COLUMN 2

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

DEDUCT AN **ADDITIONAL 10%** ON ALL PRODUCTS DURING SUPER SALE

OFFER ENDS JANUARY 31, 2011

To order online visit www.lifeextension.com/SuperSale

No.		Retail	Member Price	Qty	Total
00999	BREAST HEALTH FORMULA - 60 veg. caps	\$34.00	\$25.50		
	BREAST HEALTH FORMULA - 4 bottles of 60 veg. caps	120.00	90.00		
00893	BRITE EYES III - 2 vials, 5 ml each	34.00	25.50		
	BRITE EYES III - 4 boxes	128.00	96.00		
00136	BROMELAIN POWDER - 100 grams of powder	21.00	15.75		
	BROMELAIN POWDER - 4 bottles of powder	75.00	56.25		
01203	(SPECIALY COATED) BROMELAIN - 500 mg, 60 enteric coated tablets	21.00	15.75		
	(SPECIALY COATED) BROMELAIN - 4 bottles of 60 tablets	76.00	57.00		
00884	BUTTERBUR EXT. W/ STANDARDIZED ROSMARINIC ACID - 60 softgels	44.00	33.00		
	BUTTERBUR EXT. W/ STANDARDIZED ROSMARINIC ACID - 4 bottles of 60 softgels	158.40	118.80		
C					
01015	CALCIUM CITRATE - 300 caps	\$24.00	\$18.00		
	CALCIUM CITRATE - 4 bottles of 300 caps	85.00	63.75		
00535	CALCIUM D-GLUCARATE - 200 mg, 60 caps	18.00	13.50		
	CALCIUM D-GLUCARATE - 4 bottles of 60 caps	60.00	45.00		
01493	CALORIE CONTROL WEIGHT MANAGEMENT FORMULA BLUEBERRY-POMEGRANATE FLAVOR - 402 grams powder	56.00	42.00		
	CALORIE CONTROL WEIGHT MANAGEMENT FORMULA BLUEBERRY-POMEGRANATE FLAVOR - 4 jars of 402 grams powder	192.00	144.00		
	CALORIE CONTROL WEIGHT MANAGEMENT FORMULA BLUEBERRY-POMEGRANATE FLAVOR - 8 jars of 402 grams powder	352.00	264.00		
00118	CAPSULE FILLER MACHINE FOR "00" CAPSULES	17.95	13.46		
	CAPSULE FILLER MACHINE FOR "00" CAPSULES - 4 machines	69.00	51.75		
00613	CAPSULE FILLER MACHINE FOR "0" CAPSULES	17.95	13.46		
	CAPSULE FILLER MACHINE FOR "0" CAPSULES - 4 machines	69.00	51.75		
00916	(OPTIMIZED) CARNITINE w/GLYCOCARN® - 60 veg. caps	29.00	21.75		
	(OPTIMIZED) CARNITINE w/GLYCOCARN® - 4 bottles of 60 veg. caps	104.40	78.30		
01041	L-CARNITINE CAPSULES - 500 mg, 30 caps	15.00	11.25		
	L-CARNITINE CAPSULES - 4 bottles of 30 caps	52.80	39.60		
01258	CARNOSOOTHE w/PICROPROTECT™ - 60 veg. caps	29.95	22.46		
	CARNOSOOTHE w/PICROPROTECT™ - 4 bottles of 60 veg. caps	108.00	81.00		
01287	(SUPER) CARNOSINE CAPS - 500 mg, 90 caps	66.00	49.50		
	(SUPER) CARNOSINE CAPS - 4 bottles of 90 caps	240.00	180.00		
01011	CELLULITE SUPPRESS™ FORMULA - 6 fl. oz	58.00	43.50		
	CELLULITE SUPPRESS™ FORMULA - 4-6oz bottles	208.00	156.00		
00390	CDP CHOLINE CAPS - 250 mg, 60 caps	36.00	27.00		
	CDP CHOLINE CAPS - 4 bottles of 60 caps	136.00	102.00		
00998	CELL SENSOR-EMF DETECTION/MEASUREMENT METER	39.95	29.95		
01370	CHILDREN'S FORMULA MIX - 100 chewable tablets	18.00	13.50		
	CHILDREN'S FORMULA MIX - 4 bottles of 100 chewable tablets	64.00	48.00		
00550	CHLORELLA - 500 mg, 200 tablets	23.50	17.63		
	CHLORELLA - 4 bottles of 200 tablets	84.00	63.00		
01548	CHLOROPHYLLIN w/ZINC - 100 softgels	24.00	18.00		
	CHLOROPHYLLIN w/ZINC - 4 bottles of 100 softgels	80.00	60.00		
*01359	CHO-LESS - 90 capsules	32.50	24.38		
00541	CHOLINE CHLORIDE - 16 oz liquid	14.95	11.21		
	CHOLINE CHLORIDE - 4 bottles of 16 oz liquid	56.00	42.00		
00364	CHONDROITIN SULFATE CONCENTRATE - 400 mg, 60 tablets	19.95	14.96		
	CHONDROITIN SULFATE CONCENTRATE - 4 bottles of 60 tablets	72.00	54.00		
01218	CHROMIUM ULTRA - 100 veg. caps	24.00	18.00		
	CHROMIUM ULTRA - 4 bottles of 100 veg. caps	84.00	63.00		
01504	(OPTIMIZED) CHROMIUM W/CROMINEX® 3+ - 500 mcg, 60 veg. caps	9.00	6.75		
	(OPTIMIZED) CHROMIUM W/CROMINEX® 3+ - 4 bottles of 60 veg. caps	32.00	24.00		
00551	CILANTRO HERBAL EXTRACT - 1 oz	12.00	9.00		
	CILANTRO HERBAL EXTRACT - 4 bottles of 1oz	44.00	33.00		

* Not for sale to wholesalers or retail stores.

SUB-TOTAL OF COLUMN 3

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

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

Buyers Club Order Form

No.		Retail	Member Price	Qty	Total
01503	CINSULIN® w/INSEA²™ AND CROMINEX® 3+ - 90 veg. caps	\$38.00	\$28.50		
	CINSULIN® w/INSEA²™ AND CROMINEX® 3+ - 4 bottles of 90 veg. caps	136.00	102.00		
00069	CITRUS BIOFLAVONOID - 100 caps	15.99	11.99		
	CITRUS BIOFLAVONOID - 4 bottles of 100 caps	59.28	44.46		
00818	(SUPER) CLA BLEND W/SESAME LIGNANS - 1000 mg, 120 softgels	36.00	27.00		
	(SUPER) CLA BLEND w/SESAME LIGNANS - 4 bottles of 120 softgels	132.00	99.00		
	(SUPER) CLA BLEND w/SESAME LIGNANS - 10 bottles, 120 softgels	263.30	197.48		
00819	(SUPER) CLA BLEND w/GUARANA & SESAME - 120 softgels	42.00	31.50		
	(SUPER) CLA BLEND w/GUARANA & SESAME - 4 btl of 120 softgels	153.32	114.99		
00050	COD LIVER OIL - 12 fl oz (355 ml) (Emulsified)	14.58	10.94		
	COD LIVER OIL - 4 bottles of 12 fl oz (355 ml)	49.08	36.81		
00293	COD LIVER OIL - 100 softgels (Emulsified)	9.95	7.46		
	COD LIVER OIL - 4 bottles of 100 softgels	37.52	28.14		
00922	COGNITEX w/PREGNENOLONE & NEUROPROTECTION COMPLEX - 90 softgels	74.00	55.50		
	COGNITEX w/PREGNENOLONE & NEUROPROTECTION COMPLEX - 4 btl of 90 softgels	266.40	199.80		
	COGNITEX w/PREGNENOLONE & NEUROPROTECTION COMPLEX - 12 btl of 90 softgels	768.00	576.00		
00921	COGNITEX w/o PREGNENOLONE w/NEUROPROTECTION COMPLEX - 90 softgels	72.00	54.00		
	COGNITEX w/o PREGNENOLONE w/NEUROPROTECTION COMPLEX - 4 bottles of 90 softgels	256.00	192.00		
	COGNITEX w/o PREGNENOLONE w/NEUROPROTECTION COMPLEX - 12 bottles of 90 softgels	744.00	558.00		
01421	COGNITEX BASICS - 60 softgels	38.00	28.50		
	COGNITEX BASICS - 4 bottles of 60 softgels	140.00	105.00		
	COGNITEX BASICS - 12 bottles of 60 softgels	384.00	288.00		
00110	COMPLETE B-COMPLEX - 180 caps	21.50	16.13		
	COMPLETE B-COMPLEX - 4 bottles of 180 caps	72.00	54.00		
01574	COMPREHENSIVE NUTRIENT PACK - 30-day supply	189.00	141.75		
	COMPREHENSIVE NUTRIENT PACK - 120-day supply	684.00	513.00		
00119	COPPER CAPSULES - 2 mg, 100 caps	8.95	6.71		
	COPPER CAPSULES - 4 bottles of 100 caps	32.36	24.27		
00949	(SUPER ABSORBABLE) COQ10™ w/ d-LIMONENE - 50 mg, 60 softgels	25.00	18.75		
	(SUPER ABSORBABLE) COQ10™ w/ d-LIMONENE - 4 bottles of 60 softgels	88.00	66.00		
	(SUPER ABSORBABLE) COQ10™ w/ d-LIMONENE - 10 bottles of 60 softgels	200.00	150.00		
00950	(SUPER ABSORBABLE) COQ10™ w/ d-LIMONENE - 100 mg, 100 softgels	66.00	49.50		
	(SUPER ABSORBABLE) COQ10™ w/ d-LIMONENE - 4 bottles of 100 softgels	240.00	180.00		
	(SUPER ABSORBABLE) COQ10™ w/ d-LIMONENE - 10 bottles of 100 softgels	560.00	420.00		
01226	(SUPER UBIQUINOL) COQ10 - 100 mg, 60 softgels	56.00	42.00		
	(SUPER UBIQUINOL) COQ10 - 4 bot of 60 softgels	208.00	156.00		
	(SUPER UBIQUINOL) COQ10 - 10 bot of 60 softgels	480.00	360.00		
01426	(SUPER UBIQUINOL) COQ10 W/ENH MITOCHONDRIAL SUPPORT™ - 100 mg, 60 softgels	62.00	46.50		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bot of 60 softgels	224.00	168.00		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 10 bot of 60 softgels	520.00	390.00		
01425	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 50 mg, 100 softgels	58.00	43.50		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bot of 100 softgels	212.00	159.00		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 10 bot of 100 softgels	500.00	375.00		
01427	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 50 mg, 30 softgels	20.00	15.00		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bot of 30 softgels	72.00	54.00		
01431	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 200 mg, 30 softgels	62.00	46.50		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bot of 30 softgels	224.00	168.00		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 10 bot of 30 softgels	520.00	390.00		
01053	CORIOLUS VERSICOLOR SUPER STRENGTH - 600 mg, 150 veg. caps	99.95	74.96		
00857	COROMEGA CHILD BRAIN & BODY - (Lemon Lime) 30 packets	25.00	18.75		
	COROMEGA CHILD BRAIN & BODY - (Lemon Lime) 4 boxes of 30 packets	90.00	67.00		

SUB-TOTAL OF COLUMN 4

FEBRUARY 2011

Buyers Club Order Form

SUPER SALE SAVINGS ON ALL PRODUCTS
To order call: 1-954-766-8433 or 1-800-544-4440

No.		Retail	Member Price	Qty	Total
C CONTINUED					
80118	COSMESIS ANTI-AGING MASK - 2 oz bottle	\$72.00	\$54.00		
	COSMESIS ANTI-AGING MASK - 2-2 oz bottles	126.72	95.04		
80134	COSMESIS ANTI-GLYCATION SERUM - 1 oz bottle w/BLUEBERRY & POMEGRANATE EXTRACTS	33.00	24.75		
	COSMESIS ANTI-GLYCATION SERUM - 2-1 oz bottles w/BLUEBERRY & POMEGRANATE EXTRACTS	62.70	47.02		
80133	COSMESIS ANTIOXIDANT FACIAL MIST - 2 oz bottle	32.00	24.00		
	COSMESIS ANTIOXIDANT FACIAL MIST - 2-2 oz bottles	60.80	45.60		
80127	COSMESIS ANTIOXIDANT REJUVENATING FOOT CREAM - 2 oz jar	45.00	33.75		
	COSMESIS ANTIOXIDANT REJUVENATING FOOT CREAM - 2-2 oz jar	85.60	64.20		
80128	COSMESIS ANTIOXIDANT REJUVENATING FOOT SCRUB - 2 oz jar	59.00	44.25		
	COSMESIS ANTIOXIDANT REJUVENATING FOOT SCRUB - 2-2 oz jar	103.84	77.88		
80117	COSMESIS ANTIOXIDANT REJUVENATING HAND CREAM - 2 oz jar	64.00	48.00		
	COSMESIS ANTIOXIDANT REJUVENATING HAND CREAM - 2-2 oz jars	114.98	86.24		
80121	COSMESIS ANTIOXIDANT REJUVENATING HAND SCRUB - 2 oz jar	58.00	43.50		
	COSMESIS ANTIOXIDANT REJUVENATING HAND SCRUB - 2-2 oz jars	102.08	76.56		
80105	COSMESIS ANTI-REDNESS & BLEMISH LOTION - 1 oz	74.50	55.88		
	COSMESIS ANTI-REDNESS & BLEMISH LOTION - 2-1 oz bottles	131.12	98.34		
80120	COSMESIS CORRECTIVE CLEARING MASK - 2 oz jar	64.50	48.38		
	COSMESIS CORRECTIVE CLEARING MASK - 2-2 oz jars	113.52	85.14		
80108	COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 1 oz	74.95	56.21		
	COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 2-1 oz bottles	131.90	98.92		
80123	COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM - 2 oz jar	69.50	52.13		
	COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM - 2-2 oz jars	122.32	91.74		
80107	COSMESIS FINE LINE-LESS - 1 oz	74.50	55.88		
	COSMESIS FINE LINE-LESS - 2-1 oz bottles	131.12	98.34		
80131	COSMESIS HAIR SUPPRESS FORMULA - 4 oz bottle	59.00	44.25		
	COSMESIS HAIR SUPPRESS FORMULA - 2- 4 oz bottles	103.84	77.88		
80137	COSMESIS HEALING FORMULA ALL-IN-ONE CREAM - 1 oz jar	53.00	39.75		
	COSMESIS HEALING FORMULA ALL-IN-ONE CREAM - 2-1 oz jars	90.86	68.14		
80115	COSMESIS HEALING MASK - 2 oz bottle	64.50	48.38		
	COSMESIS HEALING MASK - 2-2 oz bottles	113.52	85.14		
80109	COSMESIS HYALURONIC FACIAL MOISTURIZER - 1 oz	58.00	43.50		
	COSMESIS HYALURONIC FACIAL MOISTURIZER - 2 bottles of 1 oz	102.08	76.56		
80110	COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 1 oz	58.00	43.50		
	COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 2 btl of 1 oz	102.08	76.56		
80138	COSMESIS HYDRATING ANTI-OXIDANT FACE MIST - 4 oz bottle	39.95	29.96		
	COSMESIS HYDRATING ANTI-OXIDANT FACE MIST - 2 bottles of 4 oz	76.00	57.00		
80103	COSMESIS LIFTING & TIGHTENING COMPLEX - 1 oz	74.50	55.88		
	COSMESIS LIFTING & TIGHTENING COMPLEX - 2 bottles of 1 oz	131.12	98.34		
80135	COSMESIS MELATONIN CREAM - 1 oz jar	33.00	24.75		
	COSMESIS MELATONIN CREAM - 2 -1 oz jars	54.20	40.65		
80114	COSMESIS MILD FACIAL CLEANSER - 8 oz	59.00	44.25		
	COSMESIS MILD FACIAL CLEANSER - 2 bottles of 8 oz	103.84	77.88		
80122	COSMESIS NECK REJUVENATING ANTIOXIDANT CREAM - 2 oz jar	64.00	48.00		
	COSMESIS NECK REJUVENATING ANTIOXIDANT CREAM - 2-2 oz jars	112.64	84.48		
80119	COSMESIS PEEL OFF CLEANSING MASK - 2 oz bottle	64.50	48.38		
	COSMESIS PEEL OFF CLEANSING MASK - 2-2 oz bottles	113.52	85.14		
80111	COSMESIS PIGMENT CORRECTING CREAM - 1/2 oz	74.00	55.50		
	COSMESIS PIGMENT CORRECTING CREAM - 2 bottles of 1/2 oz	130.24	97.68		
80106	COSMESIS REJUVENATING SERUM - 1 oz	74.50	55.88		
	COSMESIS REJUVENATING SERUM - 2 bottles of 1 oz	131.12	98.34		
80112	COSMESIS SKIN LIGHTENING SERUM - 1/2 oz	85.00	63.75		
	COSMESIS SKIN LIGHTENING SERUM - 2 bottles of 1/2 oz	149.60	112.20		

SUB-TOTAL OF COLUMN 5

FEBRUARY 2011

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

DEDUCT AN **ADDITIONAL 10%** ON ALL PRODUCTS DURING SUPER SALE

No.		Retail	Member Price	Qty	Total
D					
01063	DERMA-VITS™ - 90 caps		\$14.99	\$11.24	
01313	DERMA WHEY- 400 mg, 60 caps		65.00	48.75	
	DERMA WHEY- 4 bottles of 60 caps		236.00	177.00	
00856	(BARLEAN'S KID'S) DHA (Fruit Punch Flavor)- 8 fl. oz		22.00	16.50	
	(BARLEAN'S KID'S) DHA (Fruit Punch Flavor)- 4 bottles of 8 fl. oz		80.00	60.00	
00995	DHA 240 - 240 mg, 60 softgels		19.00	14.25	
	DHA 240 - 4 bottles of 60 softgels		68.00	51.00	
00658	7-KETO® DHEA METABOLITE - 25 mg, 100 caps		28.00	21.00	
	7-KETO® DHEA METABOLITE - 4 bottles of 100 caps		96.00	72.00	
01271	7-KETO® DHEA METABOLITE - 100 mg, 60 veg. caps		40.00	30.00	
	7-KETO® DHEA METABOLITE - 4 bottles of 60 veg. caps		144.00	108.00	
00607	DHEA - 25 mg dissolve in mouth 100 tablets		14.00	10.50	
	DHEA - 4 bottles of 100 tablets		47.00	35.25	

* Not eligible for member discount or member renewal product credit.

SUB-TOTAL OF COLUMN 6

OFFER ENDS JANUARY 31, 2011

To order online visit www.lifeextension.com/SuperSale

No.		Retail	Member Price	Qty	Total
01250	DHEA COMPLETE - 60 veg. caps	\$48.00	\$36.00		
	DHEA COMPLETE - 4 bottles of 60 veg. caps	172.80	129.60		
00335	DHEA - 25 mg, 100 caps	15.00	11.25		
	DHEA - 4 bottles of 100 caps	50.00	37.50		
00454	DHEA - 15 mg, 100 caps	12.00	9.00		
	DHEA - 4 bottles of 100 caps	40.00	30.00		
00882	DHEA - 50 mg, 60 caps	16.00	12.00		
	DHEA - 4 bottles of 60 caps	56.00	42.00		
00883	DHEA - 100 mg, 60 caps	22.50	16.88		
	DHEA - 4 bottles of 60 caps	76.00	57.00		
01358	DIGEST RC - 30 tablets	19.95	14.96		
	DIGEST RC - 4 boxes of 30 tablets	68.00	51.00		
01272	(ENHANCED SUPER) DIGESTIVE ENZYMES - 100 veg. caps	18.95	14.21		
	(ENHANCED SUPER) DIGESTIVE ENZYMES - 4 bottles of 100 veg. caps	64.00	48.00		
01273	(ENHANCED SUPER) DIGESTIVE ENZYMES w/PROBIOTICS - 100 veg. caps	24.00	18.00		
	(ENHANCED SUPER) DIGESTIVE ENZYMES w/PROBIOTICS - 4 bottles of 100 veg. caps	88.00	66.00		
**01042	(EUROPEAN LEG SOLUTION) DIOSMIN95 - 600 mg, 30 veg. tabs	20.00	15.00		
	(EUROPEAN LEG SOLUTION) DIOSMIN95 - 4 bottles of 30 veg. tabs	72.00	54.00		
00034	D,L-PHENYLALANINE CAPSULES - 500 mg, 100 caps	18.75	14.06		
	D,L-PHENYLALANINE CAPSULES - 4 bottles of 100 caps	64.00	48.00		
00257	DMAE BITARTRATE - 150 mg, 200 caps	14.00	10.50		
	DMAE BITARTRATE - 4 bottles of 200 caps	42.00	31.50		
00197	DMAE-GINKGO CAPSULES - 100 caps	36.00	27.00		
	DMAE-GINKGO CAPSULES - 4 bottles of 100 caps	120.00	90.00		
	DMAE-GINKGO CAPSULES - 8 bottles of 100 caps	220.00	165.00		
00059	DMG - 125 mg dimethylglycine, 60 tablets	18.50	13.88		
	DMG - 4 boxes of 60 tablets	68.00	51.00		
01547	DNA PROTECTION FORMULA - 60 veg. caps	30.00	22.50		
	DNA PROTECTION FORMULA - 4 bottles of 60 veg. caps	112.00	84.00		
00321	DR. PROCTOR'S ADVANCED HAIR FORMULA - 2 oz	39.95	29.96		
	DR. PROCTOR'S ADVANCED HAIR FORMULA - 4 bottles	128.00	96.00		
00320	DR. PROCTOR'S HAIR FORMULA SHAMPOO - 8 oz bottle	24.95	18.71		
	DR. PROCTOR'S HAIR FORMULA SHAMPOO - 4 bottles	88.00	66.00		
00376	DR. TUNG'S TONGUE CLEANER	8.45	6.34		
	DR. TUNG'S TONGUE CLEANERS - 4 quantity	32.20	24.15		
00899	DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE - 2.4 net oz jar	39.95	29.96		
	DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE - 4 jars of 2.4 net oz	155.80	116.85		
00240	DUAL-C - 90 caps	12.00	9.00		
	DUAL-C - 4 bottles of 90 caps	42.00	31.50		

E

00388	ECHINACEA - 250 mg, 60 caps	\$14.35	\$10.76		
	ECHINACEA - 4 bottles of 60 caps	50.00	37.50		
01024	EDTA - 500 mg, 100 caps	17.50	13.13		
00048	(EMULSIFIED SUPER TWIN) EPA/DHA - 12 fl. oz.	22.45	16.84		
01498	ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ - 60 softgels	56.00	42.00		
	ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ - 4 bottles of 60 softgels	208.00	156.00		
00997	ENDOTHELIAL DEFENSE™ w/GLISODIN® - 60 veg. caps	52.00	39.00		
	ENDOTHELIAL DEFENSE™ w/GLISODIN® - 4 bottles of 60 veg. caps	184.00	138.00		
00625	(MEGA) EPA/DHA - 120 softgels	19.95	14.96		
	(MEGA) EPA/DHA - 4 bottles of 120 softgels	72.00	54.00		
01428	ESSENTIAL FAT-SOLUBLE NUTRIENTS - 30 softgels	28.00	21.00		
	ESSENTIAL FAT-SOLUBLE NUTRIENTS - 4 bottles of 30 softgels	100.00	75.00		

F

†01054	FACE MASTER® PLATINUM	\$199.00	\$199.00		
00965	FAST-ACTING JOINT FORMULA - 30 caps	39.00	29.25		
	FAST-ACTING JOINT FORMULA - 4 bottles of 30 caps	144.00	108.00		
20053	FEM DOPHILUS® - 30 caps	24.95	18.71		
20055	FEM DOPHILUS® - 60 caps	35.95	26.96		

SUB-TOTAL OF COLUMN 7

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

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

Buyers Club Order Form

No.		Retail	Member Price	Qty	Total
01064	FEMMENESSENCE MACAPAUSE® - 120 veg. caps	\$34.99	\$26.24		
*01311	(ENHANCED) FERNBLOCK® w/SENDARA™ - 30 veg. caps	39.00	29.25		
	(ENHANCED) FERNBLOCK® w/SENDARA™ - 4 bottles of 30 veg. caps	140.00	105.00		
00229	FIBER FOOD CAPS - 200 caps	15.00	11.25		
	FIBER FOOD CAPS - 4 bottles of 200 caps	50.00	37.50		
	FIBER FOOD CAPS - 10 bottles of 200 caps	119.00	89.25		
00228	FIBER FOOD - 300 grams of powder	15.00	11.25		
	FIBER FOOD - 4 bottles of powder	50.00	37.50		
	FIBER FOOD - 10 bottles of powder	119.00	89.25		
00718	FIBRINOGEN RESIST FORMULA (NATTOKINASE) - 30 veg. caps	49.00	36.75		
	FIBRINOGEN RESIST FORMULA (NATTOKINASE) - 4 bottles of 30 caps	176.00	132.00		
00873	FLAXSEED POWDER (HI-LIGNAN NUTRI-FLAX) - 16 oz powder	9.95	7.46		
01200	FLORASTOR® - 250 mg, 50 caps	55.15	41.36		
01312	(OPTIMIZED) FOLATE (5-METHYLTETRAHYDROFOLATE) - 100 veg. caps	28.00	21.00		
	(OPTIMIZED) FOLATE (5-METHYLTETRAHYDROFOLATE) - 4 bottles of 100 veg. caps	100.00	75.00		
00347	FOLIC ACID + B12 CAPSULES - 200 caps	10.50	7.88		
	FOLIC ACID + B12 CAPSULES - 4 bottles of 200 caps	38.00	28.50		
00300	FORSKOLIN - 10 mg, 60 caps of elemental forskolin	15.00	11.25		
	FORSKOLIN - 4 bottles of 60 caps of elemental forskolin	50.00	37.50		
00993	FUCOXANTHIN-SLIM™ - 90 softgels	44.00	33.00		
	FUCOXANTHIN-SLIM™ - 4 bottles of 90 softgels	156.00	117.00		
C					
00127	GABA POWDER - 100 grams of powder	\$23.75	\$17.81		
	GABA POWDER - 4 bottles of powder	90.00	67.50		
00559	GAMMA E TOCOPHEROL/TOCOTRIENOLS - 60 softgels	42.00	31.50		
	GAMMA E TOCOPHEROL/TOCOTRIENOLS - 4 bottles of 60 softgels	148.00	111.00		
00759	GAMMA E TOCOPHEROL W/SESAME LIGNANS - 60 softgels	32.00	24.00		
	GAMMA E TOCOPHEROL W/SESAME LIGNANS - 4 bottles of 60 softgels	116.00	87.00		
00117	GELATIN CAPSULES - Set of 1000 empty caps size "00"	19.00	14.25		
	GELATIN CAPSULES - 4 Sets	72.00	54.00		
01301	GH PITUITARY SUPPORT DAY FORMULA - 120 vegetarian tabs	48.00	36.00		
	GH PITUITARY SUPPORT DAY FORMULA - 4 bottles of 120 veg. tabs	176.00	132.00		
01302	GH PITUITARY SUPPORT NIGHT FORMULA - 120 veg. caps	25.00	18.75		
	GH PITUITARY SUPPORT NIGHT FORMULA - 4 bottles of 120 veg. caps	90.00	67.50		
00778	GINKGO BILOBA CERTIFIED EXTRACT™ - 120 mg, 365 caps	46.00	34.50		
	GINKGO BILOBA CERTIFIED EXTRACT™ - 2 bottles of 365 caps	87.00	65.25		
00504	(SUPER) GINKGO EXTRACT - 120 mg, 100 caps	29.00	21.75		
	(SUPER) GINKGO EXTRACT - 4 bottles of 100 caps	106.00	79.50		
01032	(PANAX RED) GINSENG - 60 veg. caps	29.99	22.49		
00756	(MEGA) GLA WITH SESAME LIGNANS - 60 softgels	19.50	14.63		
	(MEGA) GLA WITH SESAME LIGNANS - 4 bottles of 60 softgels	72.00	54.00		
00345	(L) GLUTAMINE CAPSULES - 500 mg, 100 caps	14.95	11.21		
	(L) GLUTAMINE CAPSULES - 4 bottles of 100 caps	54.00	40.50		
00141	(L)-GLUTAMINE POWDER - 100 grams of powder	19.00	14.25		
	(L)-GLUTAMINE POWDER - 4 bottles of powder	67.52	50.64		
00522	GLUCOSAMINE/CHONDROITIN CAPSULES - 100 caps	38.00	28.50		
	GLUCOSAMINE/CHONDROITIN CAPSULES - 4 bottles of 100 caps	128.00	96.00		
00512	GLUCOFIT™ (COROSOLIC ACID) - 100 softgels	28.00	21.00		
	GLUCOFIT™ (COROSOLIC ACID) - 4 bottles of 100 softgels	100.00	75.00		
00113	GLUTATHIONE, C & CYSTEINE - 750 mg, 100 caps	18.00	13.50		
	GLUTATHIONE, C & CYSTEINE - 4 bottles of 100 caps	64.00	48.00		

* Due to license restrictions, this product is not for sale to wholesalers outside of the United States of America and Canada.

** Can only be sold in the United States.

† Member pricing not valid on this item.

SUB-TOTAL OF COLUMN 8

FEBRUARY 2011

Buyers Club Order Form

SUPER SALE SAVINGS ON ALL PRODUCTS
To order call: 1-954-766-8433 or 1-800-544-4440

No.		Retail	Member Price	Qty	Total
G CONTINUED					
00314	(MEGA) L-GLUTATHIONE - 250 mg, 60 caps	\$35.95	\$26.96		
	(MEGA) L-GLUTATHIONE - 4 bottles of 60 caps	129.44	97.08		
00795	GLYCINE CAPSULES - 1000 mg, 100 caps	12.00	9.00		
	GLYCINE CAPSULES - 4 bottles of 100 caps	43.20	32.40		
00128	GLYCINE POWDER - 300 grams of powder	18.00	13.50		
	GLYCINE POWDER - 4 bottles of powder	64.00	48.00		
01091	(WHOLE) GRAPE EXTRACT w/RESVERATROL - 60 veg. caps	36.00	27.00		
	(WHOLE) GRAPE EXTRACT w/RESVERATROL - 4 bottles of 60 veg. caps	136.00	102.00		
01411	GRAPE SEED EXTRACT w/RESVERATROL & PTEROSTILBENE-100 mg, 60 veg. caps	36.00	27.00		
	GRAPE SEED EXTRACT w/RESVERATROL & PTEROSTILBENE-4 bottles of 60 veg. caps	136.00	102.00		
00953	(MEGA) GREEN TEA EXTRACT - lightly caffeinated - 100 veg. caps	28.00	21.00		
	(MEGA) GREEN TEA EXTRACT - 4 bottles of 100 veg. caps	106.00	79.50		
00954	(MEGA) GREEN TEA EXTRACT - decaffeinated - 100 veg. caps	28.00	21.00		
	(MEGA) GREEN TEA EXTRACT - 4 bottles of 100 veg. caps	106.00	79.50		
H					
01074	5 HTP - 100 mg, 60 caps	\$27.95	\$20.96		
00230	HCA - 90 caps	18.00	13.50		
	HCA - 4 bottles of 90 caps	62.00	46.50		
00873	HI-LIGNAN NUTRI-FLAX - 16 oz powder	9.95	7.46		
00800	HOMOCYSTEINE RESIST - 100 caps	24.00	18.00		
	HOMOCYSTEINE RESIST - 4 bottles of 100 caps	86.40	64.80		
00067	HOODIA GORDONII - 60 caps	14.00	10.50		
00627	HUPERZINE A W/NATURAL VITAMIN E - 50 mcg, 60 caps	27.95	20.96		
	HUPERZINE A W/NATURAL VITAMIN E - 4 bottles of 60 caps	96.00	72.00		
00661	HYDRODERM® - 1 oz bottle	79.95	59.96		
	HYDRODERM® - 2 - 1 oz bottles	130.66	98.00		
I					
01060	i26 HYPERIMMUNE EGG - 140 grams of powder	\$49.99	\$42.00		
01065	IDEAL BOWEL SUPPORT 299V - 30 veg. caps	21.95	16.46		
00955	IMMUNE PROTECT W/PARACTIN® - 30 veg. caps	29.50	22.13		
	IMMUNE PROTECT W/PARACTIN® - 4 bottles of 30 veg. caps	106.20	79.65		
01049	INNERPOWER™ W/SWEET STEVIA- Tropical Flavor Powder	42.00	31.50		
00155	INOSINE CAPSULES - 500 mg, 60 caps	22.95	17.21		
	INOSINE CAPSULES - 4 bottles of 60 caps	84.00	63.00		
00109	INOSITOL CAPSULES - 500 mg, 100 caps	14.99	11.24		
	INOSITOL CAPSULES - 4 bottles of 100 caps	55.16	41.37		
00410	INOSITOL CAPSULES - 1000 mg, 360 caps	48.00	36.00		
	INOSITOL CAPSULES - 4 bottles of 360 caps	175.00	131.25		
00108	INOSITOL POWDER - 100 grams of powder	18.00	13.50		
	INOSITOL POWDER - 4 bottles of powder	67.52	50.64		
01021	INTACT DIGEST™ - 8 fl oz	35.00	26.25		
	INTACT DIGEST™ - 4 - 8 fl oz bottles	132.00	99.00		
01292	INTEGRA-LEAN® IRVINGIA - 150 mg, 60 veg. caps	34.00	25.50		
	INTEGRA-LEAN® IRVINGIA - 4 bottles of 60 veg. caps	120.00	90.00		
01002	IODORAL - 180 caps	50.00	37.50		
00563	IRON PROTEIN PLUS - 300 mg, 100 caps	24.00	18.00		
	IRON PROTEIN PLUS - 4 bottles of 100 caps	88.00	66.00		
01492	(OPTIMIZED) IRVINGIA W/PHASE 3™ - 120 veg. caps	64.00	48.00		
	CALORIE CONTROL COMPLEX				
	(OPTIMIZED) IRVINGIA w/PHASE 3™ - 4 bottles of 120 veg. caps	240.00	180.00		
SUB-TOTAL OF COLUMN 9					

FEBRUARY 2011

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

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

No.		Retail	Member Price	Qty	Total
J, K					
00056	JARRO-DOPHILUS EPS™ - 60 veg. caps	\$19.95	\$14.96		
01224	(SUPER) K WITH ADVANCED K2 COMPLEX - 90 softgels	26.00	19.50		
	(SUPER) K WITH ADVANCED K2 COMPLEX - 4 bottles of 90 softgels	92.00	69.00		
01050	NKO KRILL OIL - 60 softgels	33.95	25.46		
00316	KYOLIC® GARLIC FORMULA 102 - 350 mg, 200 caps	23.95	17.96		
	KYOLIC® GARLIC FORMULA 102 - 4 bottles of 200 caps	82.00	61.50		
00214	KYOLIC® GARLIC FORMULA 105 - 200 caps	22.95	17.21		
	KYOLIC® GARLIC FORMULA 105 - 4 bottles of 200 caps	73.00	54.75		
00789	KYOLIC® RESERVE - 600 mg, 120 caps	24.75	18.56		
	KYOLIC® RESERVE - 4 bottles of 120 caps	85.80	64.36		
L					
00513	LACTOFERRIN (APOLACTOFERRIN) CAPS - 300 mg, 60 caps	\$40.00	\$30.00		
	LACTOFERRIN (APOLACTOFERRIN) CAPS - 4 bottles of 60 caps	144.00	108.00		
00017	LAVILIN UNDERARM DEODORANT - 12.5 grams of cream	15.00	11.25		
	LAVILIN UNDERARM DEODORANT - 4 jars of cream	55.00	41.25		
01003	LIFE EXTENSION CAT MIX - 100 grams of powder	15.00	11.25		
	LIFE EXTENSION CAT MIX - 4 bottles of powder	48.00	36.00		
00544	LIFE EXTENSION DOG MIX - 100 grams of powder	19.50	14.63		
	LIFE EXTENSION DOG MIX - 4 bottles of powder	64.00	48.00		
00010	LIFE EXTENSION HAIR CONDITIONER - 16 oz bottle	6.00	4.50		
	LIFE EXTENSION HAIR CONDITIONER - 4 bottles	18.00	13.50		
00020	LIFE EXTENSION LECITHIN GRANULES - 16 oz. jar	15.00	11.25		
	LIFE EXTENSION LECITHIN GRANULES - 4 jars	50.00	37.50		
00019	LIFE EXTENSION LECITHIN w/B5 AND BHA - 16 oz. jar	15.00	11.25		
	LIFE EXTENSION LECITHIN w/B5 AND BHA - 4 16 oz. 4 jars	50.00	37.50		
01538	LIFE EXTENSION MIX™ - 315 veg. tablets	98.00	73.50		
	LIFE EXTENSION MIX™ - 4 bottles of 315 veg. tablets	344.00	258.00		
	LIFE EXTENSION MIX™ - 10 bottles of 315 veg. tablets	695.00	521.25		
01555	LIFE EXTENSION MIX™ - 315 tablets	98.00	73.50		
	LIFE EXTENSION MIX™ - 4 bottles of 315 tablets	344.00	258.00		
	LIFE EXTENSION MIX™ - 10 bottles of 315 tablets	695.00	521.25		
01557	LIFE EXTENSION MIX™ W/EXTRA NIACIN - 315 tablets	98.00	73.50		
	LIFE EXTENSION MIX™ w/EXTRA NIACIN - 4 bottles of 315 tablets	344.00	258.00		
	LIFE EXTENSION MIX™ w/EXTRA NIACIN - 10 bottles of 315 tablets	695.00	521.25		
01554	LIFE EXTENSION MIX™ - 490 caps	110.00	82.50		
	LIFE EXTENSION MIX™ - 4 bottles of 490 caps	392.00	294.00		
	LIFE EXTENSION MIX™ - 10 bottles of 490 caps	850.00	637.50		
01556	LIFE EXTENSION MIX™ POWDER - 14.81 oz of powder	98.00	73.50		
	LIFE EXTENSION MIX™ POWDER - 4 bottles of powder	344.00	258.00		
	LIFE EXTENSION MIX™ POWDER - 10 bottles of powder	720.00	540.00		
01565	LIFE EXTENSION MIX™ - 315 tablets without copper	98.00	73.50		
	LIFE EXTENSION MIX™ - 4 bottles of 315 tablets without copper	344.00	258.00		
	LIFE EXTENSION MIX™ - 10 bottles of 315 tablets without copper	695.00	521.25		
01567	LIFE EXTENSION MIX™ W/EXTRA NIACIN 315 tablets w/o copper	98.00	73.50		
	LIFE EXTENSION MIX™ w/EXTRA NIACIN 4 bottles of 315 tablets w/o copper	344.00	258.00		
	LIFE EXTENSION MIX™ W/EXTRA NIACIN 10 bottles of 315 tablets w/o copper	695.00	521.25		
01564	LIFE EXTENSION MIX™ - 490 caps without copper	110.00	82.50		
	LIFE EXTENSION MIX™ - 4 bottles of 490 caps without copper	392.00	294.00		
	LIFE EXTENSION MIX™ - 10 bottles of 490 caps without copper	850.00	637.50		
01566	LIFE EXTENSION MIX™ POWDER - 14.81 oz of powder without copper	98.00	73.50		
	LIFE EXTENSION MIX™ POWDER - 4 bottles of powder without copper	344.00	258.00		
	LIFE EXTENSION MIX™ POWDER - 10 bottles of powder without copper	720.00	540.00		
SUB-TOTAL OF COLUMN 10					

OFFER ENDS JANUARY 31, 2011

To order online visit www.lifeextension.com/SuperSale

No.		Retail	Member Price	Qty	Total
01279	LIFE EXTENSION MOUTHWASH w/POMEGRANATE - 16 oz bottle	\$18.50	\$13.88		
	LIFE EXTENSION MOUTHWASH w/POMEGRANATE - 4 -16 oz bottle	68.00	51.00		
01501	LIFE EXTENSION ONE-PER-DAY - 60 veg. tablets	19.95	14.96		
	LIFE EXTENSION ONE-PER-DAY - 4 bottles of 60 veg. tablets	72.00	54.00		
00011	LIFE EXTENSION SHAMPOO - 16 oz bottle	6.00	4.50		
	LIFE EXTENSION SHAMPOO - 4 bottles	19.00	14.25		
01278	LIFE EXTENSION TOOTHPASTE MINT FLAVOR - 4 oz	9.50	7.13		
	LIFE EXTENSION TOOTHPASTE MINT FLAVOR - 4, 4 oz tubes	34.68	26.00		
01516	LIFE EXTENSION TWO-PER-DAY - 60 veg. tablets	9.95	7.46		
	LIFE EXTENSION TWO-PER-DAY - 4 bottles of 60 veg. tablets	36.00	27.00		
01515	LIFE EXTENSION TWO-PER-DAY - 120 veg. tablets	18.95	14.21		
	LIFE EXTENSION TWO-PER-DAY - 4 bottles of 120 veg. tablets	68.00	51.00		
00263	LIFE FLORA™ - 300 mg, 120 caps	20.50	15.38		
	LIFE FLORA™ - 4 bottles of 120 caps	75.00	56.25		
01314	LIFESHIELD® IMMUNITY™ - 60 veg. caps	39.95	29.96		
00939	5-LOXIN® - 75 mg, 100 veg. caps	19.50	14.63		
	5-LOXIN® - 4 bottles of 100 veg. caps	69.00	51.75		
01013	L-LYSINE CAPSULES - 620 mg, 100 caps	9.00	6.75		
	L-LYSINE CAPSULES - 4 bottles of 100 caps	32.00	24.00		
00129	L-LYSINE POWDER - 300 grams of powder	16.00	12.00		
	L-LYSINE POWDER - 4 bottles of powder	55.00	41.25		
01470	LURALEAN® CAPS SPECIAL PROPOLMANNAN PARTICLE SIZE - 120 veg. caps	28.00	21.00		
	LURALEAN® CAPS SPECIAL PROPOLMANNAN PARTICLE SIZE - 4 bottles of 120 veg. caps	100.00	75.00		
01017	LUSTRE™ - 90 tablets	17.50	13.13		
	LUSTRE™ - 4 bottles of 90 tablets	62.00	46.50		
01028	LYCOPENE - 10 mg, 60 softgels	24.98	18.74		
00455	(MEGA) LYCOPENE EXTRACT - 15 mg, 90 softgels	35.00	26.25		
	(MEGA) LYCOPENE EXTRACT - 4 bottles of 90 softgels	120.00	90.00		

M

01044	MAGNESIUM CAPS - 500 mg, 100 caps	\$9.50	\$7.13		
	MAGNESIUM CAPS - 4 bottles of 100 caps	32.00	24.00		
00502	MAGNESIUM CITRATE CAPS - 160 mg, 100 caps	9.00	6.75		
	MAGNESIUM CITRATE CAPS - 4 bottles of 100 caps	30.00	22.50		
00704	MAITAKE™ SX-FRACTION - 90 veg. tablets	49.95	37.46		
00547	MELATONIN - 300 mcg, 100 caps	5.75	4.31		
	MELATONIN - 4 bottles of 100 caps	20.00	15.00		
01083	MELATONIN CAPSULES - 500 mcg, 200 veg. caps	18.00	13.50		
	MELATONIN CAPSULES - 4 bottles of 200 veg. caps	64.00	48.00		
00329	MELATONIN CAPSULES - 1 mg, 60 caps	5.00	3.75		
	MELATONIN CAPSULES - 4 bottles of 60 caps	18.52	13.89		
00330	MELATONIN CAPSULES - 3 mg, 60 caps	8.00	6.00		
	MELATONIN CAPSULES - 4 bottles of 60 caps	27.52	20.64		
01086	MELATONIN CAPSULES - 3 mg, 60 time-release veg. caps	10.50	7.88		
	MELATONIN CAPSULES - 4 bottles of 60 time-release veg. caps	37.52	28.14		
00331	MELATONIN CAPSULES - 10 mg, 60 caps	28.00	21.00		
	MELATONIN CAPSULES - 4 bottles of 60 caps	96.00	72.00		
00332	MELATONIN LOZENGES - 3 mg, 60 dissolve-in-mouth lozenges	8.00	6.00		
	MELATONIN LOZENGES - 4 bottles of 60 dissolve-in-mouth lozenges	27.52	20.64		
01087	MELATONIN TIME RELEASE - 300 mcg, 100 veg. caps	6.25	4.69		
	MELATONIN TIME RELEASE - 4 bottles of 100 veg. caps	22.52	16.89		
01088	MELATONIN TIME RELEASE - 750 mcg, 60 veg. caps	5.75	4.31		
	MELATONIN TIME RELEASE - 4 bottles of 60 veg. caps	20.00	15.00		

SUB-TOTAL OF COLUMN 11

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

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

Buyers Club Order Form

No.		Retail	Member Price	Qty	Total
01009	MEMORY UPGRADE - 600 grams powder	\$26.95	\$20.21		
01047	MENOPAUSE SOLUTIONS - 120 tablets	49.95	37.46		
00536	METHYLCOBALAMIN - 1 mg, 60 dissolve-in-mouth lozenges (vanilla)	9.95	7.46		
	METHYLCOBALAMIN - 4 bottles of 60 dissolve-in-mouth lozenges	32.00	24.00		
00537	METHYLCOBALAMIN - 5 mg, 60 dissolve-in-mouth lozenges (vanilla)	32.00	24.00		
	METHYLCOBALAMIN - 4 bottles of 60 dissolve-in-mouth lozenges	100.00	75.00		
	METHYLCOBALAMIN - 10 bottles of 60 dissolve-in-mouth lozenges	230.00	172.50		
00709	MIGRA-EZE (BUTTERBUR) - 60 softgels	29.50	22.13		
	MIGRA-EZE (BUTTERBUR) - 4 bottles of 60 softgels	105.32	79.00		
00702	(OPTIMIZED) MILK THISTLE (SILYMARIN) - 100 caps	42.00	31.50		
	(OPTIMIZED) MILK THISTLE (SILYMARIN) - 4 bottles of 100 caps	152.00	114.00		
00623	MINERAL FORMULA FOR MEN - 100 caps	15.00	11.25		
	MINERAL FORMULA FOR MEN - 4 bottles of 100 caps	50.00	37.50		
	MINERAL FORMULA FOR MEN - 12 bottles of 100 caps	130.00	97.50		
00624	MINERAL FORMULA FOR WOMEN - 100 caps	15.00	11.25		
	MINERAL FORMULA FOR WOMEN - 4 bottles of 100 caps	50.00	37.50		
	MINERAL FORMULA FOR WOMEN - 12 bottles of 100 caps	130.00	97.50		
01315	(SUPER) MIRAFORTE w/STANDARDIZED LIGNANS - 120 caps	62.00	46.50		
	(SUPER) MIRAFORTE w/STANDARDIZED LIGNANS - 4 bottles of 120 caps	224.00	168.00		
01569	MITOCHONDRIAL BASICS w/BIOPQQ™ - 30 caps	52.00	39.00		
	MITOCHONDRIAL BASICS w/BIOPQQ™ - 4 bottles of 30 caps	184.00	138.00		
01568	MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ™ - 120 caps	94.00	70.50		
	MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ™ - 4 bottles of 120 caps	336.00	252.00		
00803	MISTORAL III w/COQ10 - 2 fl oz bottle	28.00	21.00		
	MISTORAL III w/COQ10 - 4 bottles	101.32	75.99		
00065	MK-7 - 90 mcg, 60 softgels	28.00	21.00		
	MK-7 - 4 bottles of 60 softgels	100.00	75.00		
00451	MSM (METHYL-SULFONYL-METHANE) - 1000 mg, 100 caps	14.00	10.50		
	MSM (METHYL-SULFONYL-METHANE) - 4 bottles of 100 caps	47.80	35.85		
N					
00215	N-ACETYL CYSTEINE CAPSULES - 600 mg, 60 caps	\$14.00	\$10.50		
	N-ACETYL CYSTEINE CAPSULES - 4 bottles of 60 caps	54.00	40.50		
00168	NAPCA W/ALOE VERA - 8 fl oz bottle	10.00	7.50		
	NAPCA W/ALOE VERA - 4 bottles	36.60	27.45		
00066	NATTOKINASE - 60 softgels	24.98	18.74		
00718	NATTOKINASE (FIBRINOGEN RESIST FORMULA) - 30 caps	49.00	36.75		
	NATTOKINASE (FIBRINOGEN RESIST FORMULA) - 4 bottles of 30 caps	176.00	132.00		
00891	NATURAL APPETITE CONTROL - 90 softgels	28.00	21.00		
	NATURAL APPETITE CONTROL - 4 bottles of 90 softgels	100.80	75.60		
00984	NATURAL BP MANAGEMENT - 60 tablets	42.00	31.50		
	NATURAL BP MANAGEMENT - 4 bottles of 60 tablets	151.20	113.40		
00913	NATURAL ESOPHAGUARD - 10 softgels	19.95	14.96		
	NATURAL ESOPHAGUARD - 2 boxes of 10 softgels	38.00	28.50		
00712	NATURAL ESTROGEN w/POMEGRANATE EXTRACT - 60 caplets	38.00	28.50		
	NATURAL ESTROGEN w/POMEGRANATE EXTRACT - 4 bottles of 60 caplets	132.00	99.00		
01221	NATURAL FEMALE SUPPORT - 30 veg. caps	28.00	21.00		
	NATURAL FEMALE SUPPORT - 4 bottles of 30 veg. caps	96.00	72.00		
01471	NATURAL GLUCOSE ABSORPTION CONTROL - 60 veg. caps	39.00	29.25		
	NATURAL GLUCOSE ABSORPTION CONTROL - 4 bottles of 60 veg. caps	144.00	108.00		
00698	NATURAL RELIEF 1222™ - 2 oz tube	28.00	21.00		
	NATURAL RELIEF 1222™ - 4, 2 oz tubes	100.00	75.00		
01084	NATURAL SLEEP - 3 mg, 60 veg. caps	12.99	9.74		
	NATURAL SLEEP - 4 bottles of 60 veg. caps	40.00	30.00		

SUB-TOTAL OF COLUMN 12

FEBRUARY 2011

Buyers Club Order Form

SUPER SALE SAVINGS ON ALL PRODUCTS
To order call: 1-954-766-8433 or 1-800-544-4440

No.		Retail	Member Price	Qty	Total
N CONTINUED					
01085	NATURAL SLEEP MELATONIN - 5 mg, 60 veg. caps	\$18.00	\$13.50		
	NATURAL SLEEP MELATONIN - 4 bottles of 60 veg. caps	64.00	48.00		
00987	NATURAL STRESS RELIEF - 30 veg. caps	28.00	21.00		
	NATURAL STRESS RELIEF - 4 bottles of 30 veg. caps	96.00	72.00		
01076	NEW FACE SOLUTION - 1.7 oz bottle	54.00	40.50		
	NEW FACE SOLUTION - 4 bottles of 1.7 oz	196.00	147.00		
00096	NIACIN (B-3) CAPSULES - 1000 mg, 100 caps	12.75	9.56		
	NIACIN (B-3) CAPSULES - 4 bottles of 100 caps	48.00	36.00		
00372	NIACIN (B-3) CAPSULES - 500 mg, 100 caps	7.65	5.74		
	NIACIN (B-3) CAPSULES - 4 bottles of 100 caps	26.60	19.95		
00373	NO-FLUSH NIACIN - 800 mg, 100 caps	19.00	14.25		
	NO-FLUSH NIACIN - 4 bottles of 100 caps	68.00	51.00		
01035	NUTRIM POWDER - 170 grams powder	25.95	19.46		
00523	N-ZIMES® - 270 caps	23.90	17.93		
	N-ZIMES® - 4 bottles of 270 caps	88.00	66.00		
O					
00104	OCTACOSANOL - 8000 mcg, 60 caps	\$17.99	\$13.49		
	OCTACOSANOL - 4 bottles of 60 caps	62.96	47.22		
01483	(SUPER) OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 60 softgels	18.00	13.50		
	(SUPER) OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 4 bottles of 60 softgels	64.00	48.00		
01482	(SUPER) OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 120 softgels	32.00	24.00		
	(SUPER) OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 4 bottles of 120 softgels	112.00	84.00		
	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 10 bottles of 120 softgels	249.00	186.75		
01484	(SUPER) OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (ENTERIC COATED) - 120 softgels	34.00	25.50		
	(SUPER) OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (ENTERIC COATED) - 4 bottles of 120 softgels	124.00	93.00		
	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT (ENTERIC COATED) - 10 bottles of 120 softgels	280.00	210.00		
00717	ONLY TRACE MINERALS - 90 caps	15.00	11.25		
	ONLY TRACE MINERALS - 4 bottles of 90 caps	50.00	37.50		
00915	OPTIZINC® - 30 mg, 90 veg. caps	5.95	4.46		
	OPTIZINC® - 4 bottles of 90 veg. caps	20.00	15.00		
01070	ORGANIC TOTAL BODY CLEANSE - 14-day supply	34.99	26.24		
00043	L-ORNITHINE CAPSULES - 500 mg, 100 caps	24.95	18.71		
	L-ORNITHINE CAPSULES - 4 bottles of 100 caps	80.00	60.00		
P					
00107	PABA CAPS - 500 mg, 100 caps	\$13.99	\$10.49		
	PABA CAPS - 4 bottles of 100 caps	49.32	36.99		
00073	PANCREATIN - 500 mg, 50 caps	11.99	8.99		
	PANCREATIN - 4 bottles of 50 caps	43.96	32.97		
00923	PEAK ATP® WITH GLYCOCARN® - 60 tablets	59.00	44.25		
	PEAK ATP® WITH GLYCOCARN® - 4 bottles of 60 tablets	224.00	168.00		
00342	PECTA-SOL - One-month supply modified citrus pectin	99.95	74.96		
	PECTA-SOL - Four-month supply modified citrus pectin	382.80	287.10		
01080	PECTA-SOL-C® MODIFIED CITRUS PECTIN - 270 veg. caps	69.95	52.46		
00673	(WELLBETX) PGX SOLUBLE FIBER BLEND -180 caps	34.95	26.21		
00865	PHARMAGABA™ - 60 chewable tablets	29.95	22.46		
	PHARMAGABA™ - 4 bottles of 60 chewable tablets	108.00	81.00		
01320	PHOSCHOL (NUTRASAL) - 900 mg, 100 softgels	69.45	52.09		
00368	PHOSPHATIDYLSERINE CAPS - 100 mg, 100 caps	54.00	40.50		
	PHOSPHATIDYLSERINE CAPS - 4 bottles of 100 caps	192.00	144.00		
01050	PHOSPHOMEGETM KRILL OIL - 60 softgels	33.95	25.46		
00614	PILL CUTTER/GRINDER	11.95	8.96		

SUB-TOTAL OF COLUMN 13

FEBRUARY 2011

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

DEDUCT AN **ADDITIONAL 10%** ON ALL PRODUCTS DURING SUPER SALE

No.		Retail	Member Price	Qty	Total
00561	POLICOSANOL - 10 mg, 60 tablets	\$24.00	\$18.00		
	POLICOSANOL - 6 bottles of 60 tablets	108.00	81.00		
01423	(FULL-SPECTRUM) POMEGRANATE™ - 30 softgels	24.00	18.00		
	(FULL-SPECTRUM) POMEGRANATE™ - 4 bottles of 30 softgels	84.00	63.00		
00956	POMEGRANATE EXTRACT - 30 veg. caps	19.50	14.63		
	POMEGRANATE EXTRACT - 4 bottles of 30 veg. caps	70.20	52.64		
00957	POMEGRANATE JUICE CONCENTRATE - 16 oz. liquid	25.95	19.46		
	POMEGRANATE JUICE CONCENTRATE - 4 bottles of 16 oz liquid	96.00	72.00		
00577	POTASSIUM IODIDE - 1 box, 14 tablets	6.95	5.21		
	POTASSIUM IODIDE - 4 boxes, 14 tablets	21.00	15.75		
01500	PQQ CAPS W/BIOPQQ™ - 10 mg, 30 veg. caps	24.00	18.00		
	PQQ CAPS W/BIOPQQ™ - 4 bottles of 30 veg. caps	88.00	66.00		
00302	PREGNENOLONE CAPSULES - 50 mg, 100 caps	24.00	18.00		
	PREGNENOLONE CAPSULES - 4 bottles of 100 caps	76.00	57.00		
00700	PREGNENOLONE CAPSULES - 100 mg, 100 caps	26.00	19.50		
	PREGNENOLONE CAPSULES - 4 bottles of 100 caps	90.00	67.50		
*01373	PRELOX® NATURAL SEX FOR MEN® - 60 tablets	50.00	37.50		
	PRELOX® NATURAL SEX FOR MEN® - 4 bottles of 60 tablets	180.00	135.00		
00571	PRIMAL DEFENSE® - 900 mg, 90 caplets	49.95	37.46		
	PRIMAL DEFENSE® - 4 bottles of 90 caplets	194.00	145.50		
01019	PRIMAL DEFENSE® - 180 caplets	78.95	59.21		
00525	PROBOOST THYMIC PROTEIN A™ - 4 mcg, 30 packets	72.00	54.00		
	PROBOOST THYMIC PROTEIN A™ - 4 boxes	280.00	210.00		
00869	PRO FEM CREAM - 2 fl oz pump, Progesterone Cream	32.00	24.00		
	PRO FEM CREAM - 4, 2 fl oz pumps, Progesterone Cream	116.00	87.00		
01020	PROGREENS® - 15 stick pack	22.50	16.88		
01072	PRO M INTERNAL DEODORIZER - 500 mg, 100 veg. caps	28.00	21.00		
	PRO M INTERNAL DEODORIZER - 4 bottles of 100 veg. caps	100.00	75.00		
*01495	(ULTRA NAT) PROSTATE FORMULA W/ 5-LOXIN® STAND. LIGNANS-60 softgels	38.00	28.50		
	(ULTRA NAT) PROSTATE FORMULA w/ 5-LOXIN® STAND. LIGNANS-4 bot of 60 softgels	140.00	105.00		
	(ULTRA NAT) PROSTATE FORMULA w/ 5-LOXIN® STAND. LIGNANS-12 bot of 60 softgels	384.00	288.00		
01092	(ENHANCED LIFE EXTENSION) PROTEIN (VANILLA) - 1 kg of powder	38.00	28.50		
	(ENHANCED LIFE EXTENSION) PROTEIN (VANILLA) - 4 bot of powder	144.00	108.00		
01093	(ENHANCED LIFE EXTENSION) PROTEIN (CHOCOLATE) - 1 kg of powder	38.00	28.50		
	(ENHANCED LIFE EXTENSION) PROTEIN (CHOCOLATE) - 4 bot of powder	144.00	108.00		
01094	(ENHANCED LIFE EXTENSION) PROTEIN (NATURAL) - 1 kg of powder	38.00	28.50		
	(ENHANCED LIFE EXTENSION) PROTEIN (NATURAL) - 4 bot of powder	144.00	108.00		
01095	(ENHANCED LIFE EXTENSION) PROTEIN (BERRY) - 1 kg of powder	38.00	28.50		
	(ENHANCED LIFE EXTENSION) PROTEIN (BERRY) - 4 bot of powder	144.00	108.00		
00290	(DESIGNER WHEY) PROTEIN - Vanilla 2 lbs of powder	42.49	31.87		
	(DESIGNER WHEY) PROTEIN - 4 bottles of Vanilla powder	154.00	115.50		
00282	(DESIGNER WHEY) PROTEIN - Chocolate 2 lbs of powder	42.49	31.87		
	(DESIGNER WHEY) PROTEIN - 4 bottles of Chocolate powder	154.00	115.50		
00283	(DESIGNER WHEY) PROTEIN - Natural 2 lbs of powder	42.49	31.87		
	(DESIGNER WHEY) PROTEIN - 4 bottles of Natural powder	154.00	115.50		
01056	PURE-GAR® - 200 caps	24.95	18.71		
	PURE-GAR® - 4 bottles of 200 caps	84.00	63.00		
01075	PURE PLANT PROTEIN - Natural Vanilla 450 grams	36.00	27.00		
	PURE PLANT PROTEIN - 4 jar powder	132.00	99.00		
01209	(WATER-SOLUBLE) PUMPKIN SEED EXTRACT - 60 veg. caps	20.00	15.00		
	(WATER-SOLUBLE) PUMPKIN SEED EXTRACT - 4 bottles 60 veg. caps	72.00	54.00		
01210	(WATER-SOLUBLE) PUMPKIN SEED EXT w/SOY ISOFLAVONES - 60 veg. caps	22.00	16.50		
	(WATER-SOLUBLE) PUMPKIN SEED EXT w/SOY ISOFLAVONES - 4 bottles 60 veg.	80.00	60.00		
01031	PYCNOGENOL® - 60 veg. caps	86.95	65.21		

* Product cannot be sold outside the USA.

SUB-TOTAL OF COLUMN 14

OFFER ENDS JANUARY 31, 2011

To order online visit www.lifeextension.com/SuperSale

No.	Retail	Member Price	Qty	Total
P CONTINUED				
01217 PYRIDOXAL 5'-PHOSPHATE - 100 mg, 60 veg. caps	\$22.00	\$16.50		
PYRIDOXAL 5'-PHOSPHATE - 4 bottles of 60 veg. caps	79.20	59.40		
Q, R				
01309 (OPTIMIZED) QUERCETIN - 250 mg, 60 veg. caps	\$18.00	\$13.50		
(OPTIMIZED) QUERCETIN - 4 bottles of 60 veg. caps	68.00	51.00		
01030 RED YEAST RICE (Bluebonnet) - 600 mg, 60 veg. caps	16.95	12.71		
00979 RED YEAST RICE (Nature's Plus) - 600 mg, 60 veg. caps	23.20	17.40		
00060 RED YEAST RICE EXTENDED RELEASE (Nature's Plus) - 30 veg. tablets	20.95	15.71		
00605 REGIMINT® - 60 enteric-coated caps	19.95	14.96		
REGIMINT® - 4 bottles of 60 caps	74.68	56.01		
00448 REJUVENEX® BODY LOTION - 6 oz tube	24.00	18.00		
REJUVENEX® BODY LOTION - 4 tubes	79.20	59.40		
REJUVENEX® BODY LOTION - 8 tubes	136.00	102.00		
00918 REJUVENEX® FACTOR - 1.7 oz Airless pump bottle	65.00	48.75		
REJUVENEX® FACTOR - 2 bottles	120.00	90.00		
REJUVENEX® FACTOR - 4 bottles	220.00	165.00		
REJUVENEX® FACTOR - 8 bottles	399.28	299.46		
01220 (ULTRA) REJUVENEX® - 2 oz jar	52.00	39.00		
(ULTRA) REJUVENEX® - 2 jars	96.00	72.00		
(ULTRA) REJUVENEX® - 4 jars	176.00	132.00		
(ULTRA) REJUVENEX® - 8 jars	319.44	239.38		
00676 (ULTRA) REJUVENIGHT (DREAM CREAM) - 2 oz jar	39.95	29.96		
(ULTRA) REJUVENIGHT (DREAM CREAM) - 4 jars	144.00	108.00		
00706 (ULTRA) REJUVENIGHT w/PROGESTERONE - 2 oz jar	42.00	31.50		
(ULTRA) REJUVENIGHT W/PROGESTERONE - 4 jars	152.00	114.00		
01413 RESVERATROL w/PTEROSTILBENE - 20 mg, 60 veg. caps	24.00	18.00		
RESVERATROL w/PTEROSTILBENE - 4 bottles of 60 veg. caps	88.00	66.00		
01410 RESVERATROL w/PTEROSTILBENE - 100 mg, 60 veg. caps	36.00	27.00		
RESVERATROL w/PTEROSTILBENE - 4 bottles of 60 veg. caps	128.00	96.00		
01430 (OPTIMIZED) RESVERATROL w/SYNERGISTIC GRAPE-BERRY ACTIVES - 250 mg, 60 veg. caps	46.00	34.50		
(OPTIMIZED) RESVERATROL w/SYNERGISTIC GRAPE-BERRY ACTIVES - 4 bottles of 60 veg. caps	165.32	124.00		
00889 RHODIOLA EXTRACT - 250 mg, 60 veg. caps	11.75	8.81		
RHODIOLA EXTRACT - 4 bottles of 60 veg. caps	42.32	31.74		
00972 (D) RIBOSE POWDER - 150 grams of powder	27.50	20.63		
(D) RIBOSE POWDER - 4 jars of 150 grams	99.00	74.25		
01473 (D) RIBOSE CAPS - 100 veg. tabs	32.00	24.00		
(D) RIBOSE CAPS - 4 bottles of 100 veg. tabs	112.00	84.00		
01208 (SUPER) R-LIPOIC ACID - 300 mg, 60 veg. caps	49.00	36.75		
(SUPER) R-LIPOIC ACID - 4 bottles of 60 veg. caps	180.00	135.00		
00070 RNA CAPSULES - 500 mg, 100 caps	17.95	13.46		
RNA CAPSULES - 4 bottles of 100 caps	64.64	48.48		
00917 ROSMARINIC ACID EXTRACT - 60 veg. caps	59.00	44.25		
ROSMARINIC ACID EXTRACT - 4 bottles of 60 veg. caps	212.00	159.00		
S				
01082 (JARROW) SACCHAROMYCES BOULARDII+MOS - 30 veg. caps	\$9.95	\$7.46		
01067 (JARROW) SACCHAROMYCES BOULARDII+MOS - 90 veg. caps	21.95	16.46		
01432 (OPTIMIZED) SAFFRON w/SATIEREAL - 60 veg. caps	36.00	27.00		
(OPTIMIZED) SAFFRON w/SATIEREAL - 4 bottles of 60 veg. caps	128.00	96.00		
**00573 SAMBU GUARD - 175 ml	17.49	13.99		
0358 SAME (S-ADENOSYL-METHIONINE) - 200 mg, 20 enteric coated tablets	17.00	12.75		
SAME (S-ADENOSYL-METHIONINE) - 8 boxes of 20 enteric coated tablets	120.00	90.00		

SUB-TOTAL OF COLUMN 15

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

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

Buyers Club Order Form

No.	Retail	Member Price	Qty	Total
00453 SAME (S-ADENOSYL-METHIONINE) - 200 mg, 50 enteric coated tablets	\$40.00	\$30.00		
SAME (S-ADENOSYL-METHIONINE) - 4 bottles of 50 enteric coated tablets	140.00	105.00		
00557 SAME (S-ADENOSYL-METHIONINE) - 400 mg, 20 enteric coated tablets	32.00	24.00		
SAME (S-ADENOSYL-METHIONINE) - 6 boxes of 20 enteric coated tablets	150.00	112.50		
01055 SAME (S-ADENOSYL-METHIONINE) - 400 mg, 50 tablets	72.00	54.00		
SAME (S-ADENOSYL-METHIONINE) - 4 bottles of 50 tablets	264.00	198.00		
01043 SEA-IODINE™ - 1000 mcg, 60 veg. caps	8.00	6.00		
SEA-IODINE™ - 4 bottles of 60 veg. caps	28.80	21.60		
00046 SELENIUM - 2 oz dropper bottle	9.45	7.09		
SELENIUM - 4 bottles of 2 oz bottle	36.00	27.00		
00567 SE-METHYLELENOCYSTEINE - 200 mcg, 100 caps	12.00	9.00		
SE-METHYLELENOCYSTEINE - 4 bottles of 100 caps	44.00	33.00		
00318 SERRAFLAZYME - 100 tablets	18.00	13.50		
SERRAFLAZYME - 4 bottles of 100 tablets	64.00	48.00		
00284 SHARK LIVER OIL (NORWEGIAN) - 1000 mg, 30 softgels	18.00	13.50		
SHARK LIVER OIL (NORWEGIAN) - 4 bottles of 30 softgels	64.00	48.00		
00184 SILYMARIN - 100 mg, 50 caps	9.25	6.94		
SILYMARIN - 4 bottles of 50 caps	33.00	24.75		
01502 SKIN RESTORING CERAMIDES w/LIPOWHEAT™ - 30 liquid caps	25.00	18.75		
SKIN RESTORING CERAMIDES w/LIPOWHEAT™ - 4 bottles of 30 liquid caps	92.00	69.00		
00961 SODZYME® w/GLISODIN® AND WOLFBERRY - 90 veg. caps	28.00	21.00		
SODZYME® w/GLISODIN® AND WOLFBERRY - 4 bottles of 90 veg. caps	96.00	72.00		
00657 SOLARSHIELD SUNGLASSES - 1 pair smoke color	12.99	9.74		
SOLARSHIELD SUNGLASSES - 2 pair smoke color	23.00	17.25		
01097 (ULTRA) SOY EXTRACT - 150 veg. caps	87.00	65.25		
(ULTRA) SOY EXTRACT - 4 bottles of 150 veg. caps	312.00	234.00		
00286 SOY PROTEIN POWDER (concentrated soy protein) - 16 oz of powder	12.00	9.00		
SOY PROTEIN POWDER - 4 bottles of powder	42.50	31.87		
01099 STABILUM® 200 - 30 caps	30.00	22.50		
00432 STEVIA EXTRACT - 100 packets, 1 gram each	9.95	7.46		
STEVIA EXTRACT - 4 boxes of 100 packets	36.00	27.00		
00351 ST. JOHN'S WORT EXTRACT - 300 mg, 60 caps	10.98	8.24		
ST. JOHN'S WORT EXTRACT - 4 bottles of 60 caps	40.00	30.00		
00327 ST. JOHN'S WORT EXTRACT (PLANETARY) - 600 mg, 60 tablets	16.75	12.56		
ST. JOHN'S WORT EXTRACT (PLANETARY) - 4 bottles of 60 tablets	55.40	41.55		
01476 STRONTIUM - 750 mg, 90 veg. caps	20.00	15.00		
STRONTIUM - 4 bottles of 90 veg. caps	72.00	54.00		
00971 SUN PROTECTION SPRAY W/BETA GLUCAN - SPF30 - 6 oz bottle	14.95	11.21		
SUN PROTECTION SPRAY W/BETA GLUCAN - SPF30 - 4 bottles, 6 oz	54.00	40.50		
00747 (OVERCAST POLARIZED) SUNGLASSES - gray color, large	27.00	20.25		
(OVERCAST POLARIZED) SUNGLASSES - 2 pairs, gray color	42.00	31.50		
00748 (OVERCAST POLARIZED) SUNGLASSES - gray color, medium	27.00	20.25		
(OVERCAST POLARIZED) SUNGLASSES - 2 pairs, gray color	42.00	31.50		
00758 SUPER ABSORBABLE SOY ISOFLAVONES - 60 caps	28.00	21.00		
SUPER ABSORBABLE SOY ISOFLAVONES - 4 bottles of 60 caps	100.00	75.00		
01408 SUPER SAW PALMETTO/NETTLE ROOT W/BETA-SITOSTEROL 60 softgels	28.00	21.00		
SUPER SAW PALMETTO/NETTLE ROOT W/BETA-SITOSTEROL 4 bottles of 60 softgels	104.00	78.00		
SUPER SAW PALMETTO/NETTLE ROOT w/BETA-SITOSTEROL One-year supply	288.00	216.00		

** These products are not 25% off retail price.

SUB-TOTAL OF COLUMN 16

FEBRUARY 2011

Buyers Club Order Form

SUPER SALE SAVINGS ON ALL PRODUCTS
To order call: 1-954-766-8433 or 1-800-544-4440

No.		Retail	Member Price	Qty	Total
S CONTINUED					
01407	SUPER SAW PALMETTO W/BETA-SITOSTEROL - 30 softgels	\$15.00	\$11.25		
	SUPER SAW PALMETTO W/BETA-SITOSTEROL - 12 bottles of 30 softgels	144.00	108.00		
00578	SUPER SELENIUM COMPLEX - 200 mcg, 100 caps	12.00	9.00		
	SUPER SELENIUM COMPLEX - 4 bottles of 100 caps	40.00	30.00		
	SUPER SELENIUM COMPLEX - 12 bottles of 100 caps	108.00	81.00		
00674	SYTRINOL™ - 60 softgels	32.00	24.00		
	SYTRINOL™ - 4 bottles of 60 softgels	112.00	84.00		
T					
	TAL-SHI™ COSMETICS • For information please call 1-800-544-4440 or visit www.lifeextension.com				
01062	TART CHERRY (FRUIT ADVANTAGE) - 600 mg, 60 caps	\$18.95	\$14.21		
00199	TAURINE CAPSULES - 1000 mg, 50 caps	8.95	6.71		
	TAURINE CAPSULES - 4 bottles of 50 caps	32.00	24.00		
00133	TAURINE POWDER - 300 grams, powder	20.00	15.00		
	TAURINE POWDER - 4 bottles of powder	67.52	50.64		
01304	THEAFLAVIN STANDARDIZED EXTRACT - 30 veg. caps	18.00	13.50		
	THEAFLAVIN STANDARDIZED EXTRACT - 4 bottles of 30 veg. caps	64.00	48.00		
00555	(L) THEANINE - 100 mg, 60 caps	24.00	18.00		
	(L) THEANINE - 4 bottles of 60 caps	82.00	61.50		
**01038	ATHERALAC - 30 caps	44.95	33.71		
00224	THYMIC IMMUNE FACTORS - 100 caps	18.00	13.50		
	THYMIC IMMUNE FACTORS - 4 bottles of 100 caps	56.00	42.00		
00668	(METABOLIC ADVANTAGE) THYROID FORMULA - 100 caps	21.95	16.46		
00349	TMG - 50 grams of powder	14.00	10.50		
	TMG - 4 bottles of powder	44.00	33.00		
00359	TMG TABLETS - 500 mg, 180 tablets	18.00	13.50		
	TMG TABLETS - 4 bottles of 180 tablets	62.00	46.50		
00366	TOCOTRIENOLS - 50 mg, 60 softgel caps	39.95	29.96		
	TOCOTRIENOLS - 4 bottles of 60 softgel caps	144.00	108.00		
00781	TOCOTRIENOLS WITH SESAME LIGNANS - 60 softgels	38.00	28.50		
	TOCOTRIENOLS WITH SESAME LIGNANS - 4 bottles of 60 softgels	144.00	108.00		
01400	(SUPER-ABSORBABLE) TOCOTRIENOLS - 60 softgels	30.00	22.50		
	(SUPER-ABSORBABLE) TOCOTRIENOLS - 4 bottles of 60 softgels	112.00	84.00		
01274	TOTAL SUN PROTECTION CREAM W/BETAGLUCANS - SPF 30, 4 oz Tube & PHOTO-AGING RECOVERY COMPLEX	28.00	21.00		
	TOTAL SUN PROTECTION CREAM W/BETAGLUCANS - 4-4 oz Tubes & PHOTO-AGING RECOVERY COMPLEX	100.80	75.60		
01468	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT - 60 veg. caps	24.00	18.00		
	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT - 4 bot 60 veg. caps	88.00	66.00		
01469	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL - 60 veg. caps	32.00	24.00		
	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT w/RESVERATROL - 4 bottles	118.40	88.80		
01046	TRIPLE ACTION UNDER EYE REJUVENATOR - 0.5 oz pump	24.00	18.00		
	TRIPLE ACTION UNDER EYE REJUVENATOR - 4 boxes	88.00	66.00		
00866	TRYPTOPURE® L-TRYPTOPHAN - 500 mg, 90 veg. caps	38.00	28.50		
	TRYPTOPURE® L-TRYPTOPHAN - 4 bottles of 90 veg. caps	136.00	102.00		
01202	(OPTIMIZED) TRYPTOPURE® PLUS - 90 veg. caps	40.00	30.00		
	(OPTIMIZED) TRYPTOPURE® PLUS - 4 bottles of 90 veg. caps	144.00	108.00		
00326	L-TYROSINE TABLETS - 500 mg, 100 tablets	12.50	9.38		
	L-TYROSINE TABLETS - 4 bottles of 100 tablets	45.68	34.26		

SUB-TOTAL OF COLUMN 17

FEBRUARY 2011

No.		Retail	Member Price	Qty	Total
U					
* 00310	UDO'S CHOICE® - 17 oz liquid (omega fatty acids)	\$27.49	\$21.99		
* 00311	UDO'S CHOICE® - 1000 mg, 180 caps	33.79	27.03		
* 00322	UDO'S CHOICE® WHOLESOME FAST FOOD - 1 lb bottle	27.49	21.99		
01061	ULTIMATE FLORA ADVANCED IMMUNITY - 30 caps	29.99	22.49		
V					
00213	VANADYL SULFATE - 7.5 mg, 100 tablets	\$15.00	\$11.25		
	VANADYL SULFATE - 4 bottles of 100 tablets	50.00	37.50		
00252	VELVET DEER ANTLER - 250 mg, 30 caps	36.00	27.00		
	VELVET DEER ANTLER - 4 bottles of 30 caps	136.00	102.00		
00408	VENOTONE - 60 caps	18.95	14.21		
	VENOTONE - 4 bottles of 60 caps	64.00	48.00		
00427	VINPOCETINE - 5 mg, 100 tablets	18.00	13.50		
	VINPOCETINE - 4 bottles of 100 tablets	56.00	42.00		
01033	VISION OPTIMIZER - 90 caps	29.95	22.46		
01098	VITAL GREENS MIX - 319.5 grams of powder	48.00	36.00		
	VITAL GREENS MIX - 4 jars of powder	176.00	132.00		
01219	(INTERPLEXUS) VITAMIN A NUTRISORB - 10,000 IU 0.6 fl oz	27.00	20.25		
00091	VITAMIN B1 CAPS - 500 mg, 100 caps	16.99	12.74		
	VITAMIN B1 CAPS - 4 bottles of 100 caps	60.68	45.51		
00093	VITAMIN B2 CAPS - 100 mg, 100 caps	12.99	9.74		
	VITAMIN B2 CAPS - 4 bottles of 100 caps	47.52	35.64		
00096	VITAMIN B3 (NIACIN) - 1000 mg, 100 caps	12.75	9.56		
	VITAMIN B3 (NIACIN) - 4 bottles of 100 caps	48.00	36.00		
00372	VITAMIN B3 (NIACIN) - 500 mg, 100 caps	7.65	5.74		
	VITAMIN B3 (NIACIN) - 4 bottles of 100 caps	26.60	19.95		
00098	VITAMIN B5 CAPS - 500 mg, 100 caps (Pantothenic Acid)	10.50	7.88		
	VITAMIN B5 CAPS - 4 bottles of 100 caps	37.52	28.14		
00556	VITAMIN B6 CAPS - 250 mg, 100 caps	12.50	9.38		
	VITAMIN B6 CAPS - 4 bottles of 100 caps	44.00	33.00		
00361	VITAMIN B12 TABLETS - 500 mcg, 100 dissolve-in-mouth tablets	8.75	6.56		
	VITAMIN B12 TABLETS - 4 bottles of 100 dissolve-in-mouth tablets	29.00	21.75		
00927	VITAMIN C WITH DIHYDROQUERCETIN - 1000 mg, 250 tablets	25.50	19.13		
	VITAMIN C WITH DIHYDROQUERCETIN - 4 bottles of 250 tablets	93.00	69.75		
00084	(BUFFERED) VITAMIN C POWDER - 454.6 grams of powder	23.95	17.96		
	(BUFFERED) VITAMIN C POWDER - 4 bottles of powder	88.00	66.00		
00864	VITAMIN D - 2000 IU, 1 fl oz	28.00	21.00		
	VITAMIN D - 4 bottles of 1 fl oz	100.00	75.00		
00251	VITAMIN D3 CAPS - 1000 IU, 250 caps	12.50	9.38		
	VITAMIN D3 CAPS - 4 bottles of 250 caps	45.00	33.75		
00713	VITAMIN D3 CAPS - 5000 IU, 60 caps	11.00	8.25		
	VITAMIN D3 CAPS - 4 bottles of 60 caps	39.60	29.70		
01418	VITAMIN D3 CAPS - 7000 IU, 60 caps	14.00	10.50		
	VITAMIN D3 CAPS - 4 bottles of 60 caps	50.40	37.80		
01372	VITAMIN D3 w/SEA-IODINE - 5000 IU, 60 veg. caps	14.00	10.50		
	VITAMIN D3 w/SEA-IODINE - 4 bottles of 60 veg. caps	50.00	37.50		
01472	VITAMINS D AND K w/SEA-IODINE™ - 60 veg. caps	24.00	18.00		
	VITAMINS D AND K w/SEA-IODINE™ - 4 bottles of 60 veg. caps	88.00	66.00		
00063	VITAMIN E CAPS (NATURAL) - 400 IU, 100 caps	18.75	14.06		
	VITAMIN E CAPS (NATURAL) - 4 bottles of 100 caps	69.00	51.75		
	VITAMIN E CAPS (NATURAL) - 10 bottles of 100 caps	150.00	112.50		

* These products are not 25% off retail price.
** Due to license restrictions, this product is not for sale to Canada.

SUB-TOTAL OF COLUMN 18

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

DEDUCT AN ADDITIONAL 10% ON ALL PRODUCTS DURING SUPER SALE

OFFER ENDS JANUARY 31, 2011

To order online visit www.lifeextension.com/SuperSale

No.		Retail	Member Price	Qty	Total
01225	(LOW-DOSE) VITAMIN K2 (MK-7) - 45 mcg, 90 softgels	\$18.00	\$13.50		
	(LOW-DOSE) VITAMIN K2 (MK-7) - 4 bottles of 90 softgels	64.00	48.00		
Z					
01585	(SUPER) ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN AND C3G - 60 softgels	\$22.00	\$16.50		
	(SUPER) ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN AND C3G- 4 bottles	79.20	59.40		
01586	(SUPER) ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN - 60 softgels PLUS ASTAXANTHIN AND C3G	42.00	31.50		
	(SUPER) ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN PLUS ASTAXANTHIN AND C3G- 4 bottles of 60 softgels	152.00	114.00		
00061	ZINC LOZENGES WITH VITAMIN C - 75 lozenges	9.50	7.13		
	ZINC LOZENGES WITH VITAMIN C - 4 bottles of 75 lozenges	27.00	20.25		
01051	ZYFLAMEND - 120 softgels	60.95	45.71		
01029	ZYFLAMEND EASYCAPS - 180 caps	31.95	23.96		

SUB-TOTAL OF COLUMN 19

GIVE THE GIFT of HEALTH, with a LIFE EXTENSION GIFT CARD!



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HOW TO JOIN THE LIFE EXTENSION FOUNDATION®

As a member of the Life Extension Foundation®, you have the opportunity to participate in a great scientific endeavor. We are the world's premier organization dedicated to stopping and reversing aging.

Our 30-year track record shows that we have been five to ten years ahead of conventional and alternative medicine in making new life-saving therapies available to our members.

When you join the Life Extension Foundation®, we update you on the latest published medical research by sending you FREE books. Our most impressive publication is the 1,666-page *Disease Prevention and Treatment* protocol book that contains novel therapies to treat 133 common diseases of aging. *Disease Prevention and Treatment* is the only book that combines conventional and alternative therapies in order to implement a treatment regimen for fighting the multiple processes involved in degenerative disease.

Each month, Life Extension Foundation® members receive a magazine packed with the latest medical findings from around the world. Members also can call a toll-free phone number to talk to our knowledgeable health advisors about their health issues.

If your number one priority is good health and a long life,
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1. Call toll-free 1-800-544-4440 2. Go to www.lef.org 3. Fax back to 1-866-728-1050 4. Mail to: Life Extension Foundation® • PO Box 407198 Ft. Lauderdale, FL 33340-7198 • Local Number: 954-766-8433

MEMBERSHIP APPLICATION

I want to contribute to your research efforts to extend the healthy human life span. Enclosed is my first year's membership donation of \$75 to join the most elite group of longevity enthusiasts in the world. (Canadians add \$7, all others outside the U.S. add \$35) Item code: MEMB1. Call for multiple year membership rates.

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Charge my cc: _____

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33825	THE EMPOWERED PATIENT • by Elizabeth Cohen	2010	\$15.00	\$10.50	
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33599	YOUNGER YOU • by Eric Braverman, MD	—	\$24.95	\$15.75	
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Higher Potency ArthroMax™

Full-Spectrum Joint Support
Now with Standardized Theaflavins

As we age, structural alterations occur in our joints, leading to painful inflammation, discomfort, and loss of mobility.

ArthroMax™ is a multi-nutrient formula designed to provide broad-spectrum support for aging joints and cartilage. Based on recent scientific findings, ArthroMax™ has been improved with higher potencies and an exciting new ingredient.

ArthroMax™ contains more **glucosamine sulfate** along with a special **Boswellia extract** known as **5-LOXIN®**. Glucosamine sulfate provides underlying structural foundation for joints, while 5-LOXIN® inhibits the 5-lipoxygenase enzyme, thereby reducing levels of pro-inflammatory leukotriene B4.*

Key New Ingredient... Black Tea Theaflavins

Inflammatory reactions are regulated by a series of "cytokines" produced in the body. Normal aging results in an unfavorable balance of these **cytokines** that contributes to persistent inflammatory conditions. New studies have shown that a special fraction found in **black tea** suppresses proinflammatory cytokines at the genomic level. Scientists have found that these compounds called **theaflavins** uniquely down-regulate the expression of genes and cytokines associated with inflammatory conditions.

ArthroMax™ formula provides these bioactive **theaflavin** fractions, along with **methylsulfonylmethane (MSM)**, which contains sulfur components

that are critically important in maintaining comfortable joint function.* ArthroMax™ also contains **FruiteX B® OsteoBoron®**, a patented form of boron that is identical to natural plant forms found in food. Considered more bioavailable than other forms of boron, **FruiteX B® OsteoBoron®** also supports healthy bones and joints.*

Four vegetarian capsules of new **ArthroMax™ with Theaflavins** provide the following nutrients in one convenient, joint-protecting formula:

Black tea theaflavins with TF-2a fraction 440 mg
Glucosamine sulfate 2KCl (from corn) 2000 mg
MSM (methylsulfonylmethane) 1000 mg
5-LOXIN® 100 mg
Boron 1.5 mg (as patented FruiteX B® OsteoBoron®)

ArthroMax™ with Theaflavins has less than 10 mg of caffeine per serving (the amount found in a quarter cup of brewed green tea).

The retail price of a bottle of 120 vegetarian capsules of **ArthroMax™ with Theaflavins** is \$44. If a member buys four bottles during **Super Sale**, the price is reduced to only \$27 a bottle. Contains corn.



5-LOXIN® is a registered trademark of P.L. Thomas & Co., Inc. U.S. Patents Pending.

FruiteX B® is a registered trademark and OsteoBoron® is a registered trademark of VDF FutureCeuticals, Inc. U.S. Patent #5,962,049.

Item #01317

To order ArthroMax™ with Theaflavins,
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 better Curcumin

For Optimal Absorption



In 2010, there were more than 160 published studies on curcumin. Every week, scientists discover new benefits of curcumin such as reducing inflammation and promoting healthy DNA function.

Unfortunately, not all forms of curcumin are readily absorbed into the bloodstream. As a result, you may not be achieving peak blood levels of this vital nutrient.

Super Bio-Curcumin® is absorbed up to seven times more than regular curcumin.^{1,2}

The graphs on this page illustrate that just one 400 mg capsule of **Super Bio-Curcumin®** can provide curcumin levels equivalent to ingesting **2,500-2,800 mg** of other curcumin supplements.

Additionally, **Super Bio-Curcumin®** can stay in the bloodstream almost twice as long as other curcumin supplements.

Life Extension®'s **Super Bio-Curcumin®** contains the newly patented BCM-95® turmeric compound. A bottle containing 60 **Super Bio-Curcumin® with BCM-95®** capsules retails for \$35. If a member buys four bottles during

Super Sale, the price is reduced to just **\$21.60** per bottle. Each bottle will last most members two months. Contains rice.

References:

1. Spice India. 2006 Sept;19(9):11-5.
2. Ind J Pharm Sci. 2008 Jul-Aug:445-9.
3. Bioavailability study of BCM-95® in rats. Orcas International Inc. 2006.



Item #00407

To order **Super Bio-Curcumin® with BCM-95®, call 1-800-544-4440 or visit www.LifeExtension.com**

Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC.

How Much Curcumin Are You Absorbing?

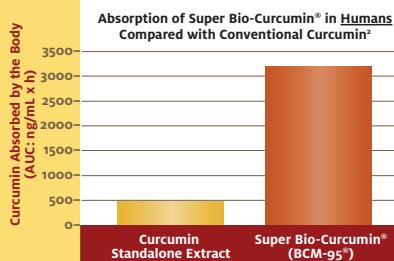


Chart 1. Super Bio-Curcumin® (BCM-95®) showed 6.9 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with conventional curcumin (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).

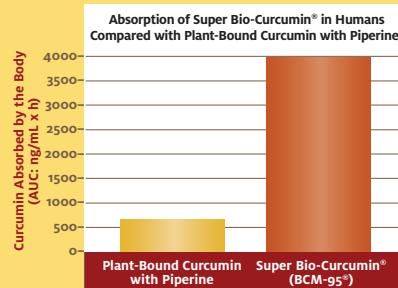


Chart 2. Super Bio-Curcumin® (BCM-95®) showed 6.3 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with plant-bound curcumin with piperine (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).

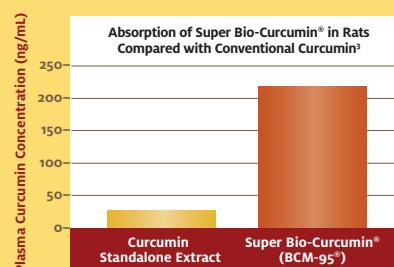


Chart 3. Bioavailability in rats fed with BCM-95® is 7.8 times higher than conventional curcumin.



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When you buy Theralac® for a friend, you'll get a bottle **FREE!**

Buy a bottle of Theralac® for a friend.

Because Theralac® is a medical-strength probiotic, they will feel it working fast, helping them **cleanse their digestive tract and improve digestive wellness** in a few short days. Surely you know someone who could benefit from the best probiotic on the market...and who will appreciate a gift from you.

Life Extension® will ship the Theralac® direct to your friend.

The Theralac® will be sent promptly, along with information about Life Extension®. They will learn why you became a member, and how they can join at a special introductory rate. Then they can buy high quality Life Extension® supplements at discounted member pricing, just like you.

You'll receive a **FREE** bottle of Theralac®.

For being so kind as to share the benefits of Life Extension® member-

30
Billion
CFU
PER CAPSULE



ship with a friend, you'll receive **YOUR FREE bottle**. You already know the benefits of Life Extension® membership. If you have never tried Theralac® here's your chance. If you have, you already know why it's the strongest probiotic on the market today. And Theralac® has been **recommended 9 times in the Blaylock Wellness Report**. Thousands of doctors around the world dispense Theralac® to their patients.

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**BUY ONE
FOR A
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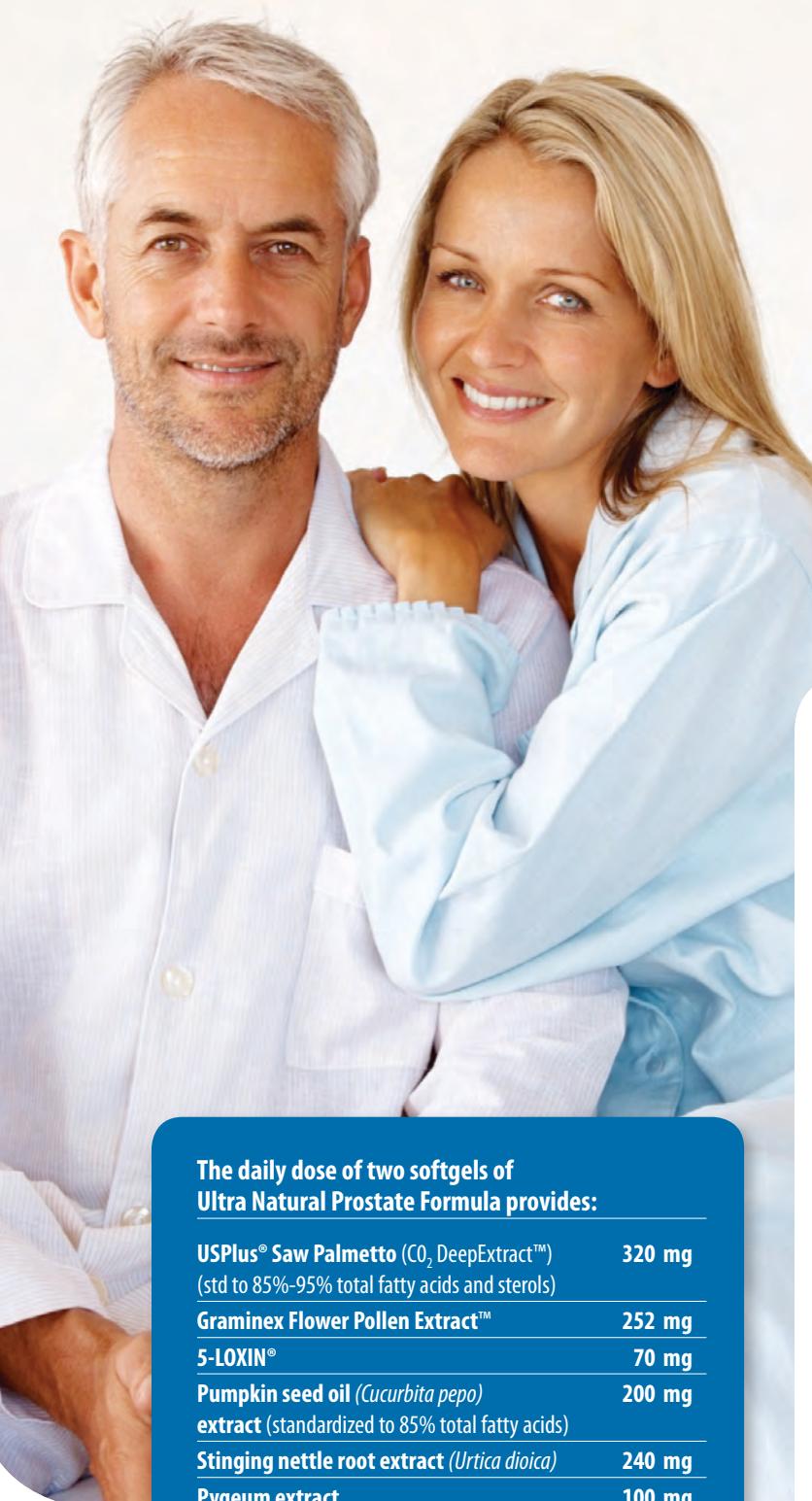
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INCORPORATED



ULTRA NATURAL PROSTATE FORMULA PROVIDES ULTRA PROTECTION

For a large percentage of men over the age of 50, having a healthy prostate is the key to living a normal life. Dietary supplementation for urinary and prostate health helps men maintain a normal hormonal balance, which promotes normal urinary flow and prostate health. Choosing to support a healthy prostate through supplementation is one of the smartest choices an aging man can make.

Ultra Natural Prostate Formula combines eleven cutting-edge *natural* ingredients that have been scientifically substantiated to protect the prostate gland and maintain its healthy function.* One of the newest additions to the formula is **European pumpkin seed oil extract**, which is rich in **delta-7 sterols** and **fatty acids**.

The formula provides **saw palmetto extract** and **Graminex Flower Pollen Extract™** to interfere with DHT activity and help regulate inflammatory reactions in the prostate.* **Lycopene** is a carotenoid that has been added to the formula to help maintain healthy DNA gene function in prostate cells.

In order to boost its anti-estrogen capabilities, **Ultra Natural Prostate Formula** incorporates **HRMLignan™**, derived from Norway spruce, flax lignans, and **nettle root extract**.

Since normal aging can lead to potentially unsafe levels of prostaglandins in the prostate, **Pygeum africanum** extract is included to help suppress prostaglandins, and thereby promote prostate comfort.* **Beta-sitosterol** has been added because it is the most biologically active component of *pygeum* and enhances its protective effects.

Ultra Natural Prostate Formula also contains **5-LOXIN® boswellia extract** to protect against the dangerous enzyme *5-lipoxygenase*, and the mineral **boron** to help slow elevation of prostate-specific antigen (PSA).

The retail price for one bottle of **Ultra Natural Prostate Formula** is \$38. If a member buys four bottles during **Super Sale**, the price is reduced to **\$23.63** per bottle. If a member buys 12 bottles during **Super Sale**, the price is reduced to **\$21.60** per bottle.

Contains soybeans.



Item #01495

The daily dose of two softgels of **Ultra Natural Prostate Formula** provides:

USPlus® Saw Palmetto (CO₂ DeepExtract™) (std to 85%-95% total fatty acids and sterols)	320 mg
Graminex Flower Pollen Extract™	252 mg
5-LOXIN®	70 mg
Pumpkin seed oil (<i>Cucurbita pepo</i>) extract (standardized to 85% total fatty acids)	200 mg
Stinging nettle root extract (<i>Urtica dioica</i>)	240 mg
Pygeum extract	100 mg
Lycopene	10 mg
Phytosterol complex (standardized to 26.6% beta-sitosterol)	678 mg
Proprietary blend of HRMLignan™ Norway Spruce and ActiFlax™ Flax Lignan extracts	20.15 mg
Boron	3 mg

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To order **Ultra Natural Prostate 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.



WHAT'S INSIDE

LifeExtension® Magazine



URGENT NEED TO RENEW MITOCHONDRIA (Page 7)

Mitochondrial dysfunction is central to most killer diseases of aging, underscoring the need for all aging humans to maintain youthful mitochondria levels. A natural coenzyme called **PQQ** has been shown to grow new mitochondria in aging cells!



ANTI-AGING POWER OF CERAMIDES (Page 26)

Ceramides are natural compounds essential to preserving young-looking skin. New research shows that when ingested, they may also improve **cholesterol** levels, enhance **glucose control**—even combat **colon cancer**.



BROAD-SPECTRUM DEFENSE OF NOVEL BERRY EXTRACT

(Page 40)

Scientists are increasingly focusing on the potent free-radical fighter **C3G**, a berry extract shown to enhance **night vision** and prevent numerous degenerative diseases.



TAKE CONTROL OF YOUR BLOOD SUGAR LEVELS (Page 66)

Chromium insufficiency directly contributes to high blood sugar. Yet **25-50%** of Americans are now chromium-deficient. Discover how a **cutting-edge chromium complex** works in synergy with other targeted nutrients to slash blood sugar levels.



SUZANNE SOMERS'S SEXY FOREVER (Page 78)

Life Extension® members know that age-related disease can be postponed or prevented through clinically validated, natural interventions. In this exclusive excerpt from her latest book, celebrity member **Suzanne Somers** brings this scientific data to a *national* audience.



JUDY COLLINS'S AGE-DEFYING SECRETS (Page 89)

After over four decades of stardom, the legendary singer-songwriter discusses some of the keys to her ageless vitality, including meditation, exercise, and **15** beneficial supplements.