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## REPORT

### The New Life Extension Mix A Medical Renaissance

#### How You Can Personally Benefit From The Combined Medical Power Of Supplemental Nutrients That Are Effective Against Degenerative Disease And Premature Aging

We are in the midst of an exponential expansion of knowledge in the life sciences. Recently, the media have reported on medical breakthroughs that could soon lead to a cure for cancer and methods to control aging. These reports are not just media hype; our analysis of the science backing these news reports indicates that we may be on the verge of radically extending the human life span.

There are people reading this who will not benefit from this medical renaissance. That's because age-related disasters such as cancer and stroke will kill them before the technology to eradicate these diseases becomes legally available. Yes, there is strong evidence that a cure for many cancers may already exist, but it will take 18 months before the Food and Drug Administration allows cancer patients to access this therapy. (See the story in this issue on how the Life Extension Foundation was 11 years ahead of mainstream medicine in recommending an anti-viral drug, ribavirin, that the FDA now finally says is effective.)

The fact that we are moving closer to achieving control over aging-related diseases has motivated us to take unprecedented actions to keep members living beyond the supposed limit dictated by their genetic time clock. We normally make improvements in the Foundation's unique Life Extension Mix formula every 18 months or so, but the science of nutritional disease prevention has advanced so quickly that we have upgraded the product again, just eight months after our last formula change.

For the enlightenment of new members, Life Extension Mix is a 60-ingredient composition of extracts from vegetables, fruits, herbs and other food concentrates that have been documented in published scientific studies to prevent disease and slow premature aging. Most Foundation members use Life Extension Mix as the cornerstone of their overall programs to live longer in optimal health.

Thousands of published studies show that the risk of contracting diseases such as cancer, stroke and heart disease can be reduced by the proper intake (and combination) of vitamins, minerals, amino acids and plant extracts. The difficulty for most people is that they don't know what nutrients are most important, or how much of each nutrient to take. Commercial supplement companies have fallen way behind in keeping up with the breakthroughs in preventive medicine that appear in the scientific literature.

Life Extension Mix has been designed, tested and used by the most aggressive life extensionists in the world, who insist on the strictest standards of pharmaceutical purity for every nutrient included in the formula.

Some people erroneously refer to Life Extension Mix as a multi-vitamin supplement, but a careful review of its ingredients shows that the formula is light years ahead of any multi-nutrient product that has ever been sold. Each ingredient in Life Extension Mix is based on hard-core scientific findings about the role that specific nutrients play in defending the body against degenerative disease.

New members are pleasantly surprised when they discover that Life Extension Mix can replace many of the individual supplements they were previously taking. The convenience of obtaining potent doses of pharmaceutical-grade nutrients is the prime motivation for taking Life Extension Mix. Another reason that Life Extension Mix is so popular is that it saves the serious supplement user hundreds of dollars a year, compared with the cost of buying the included ingredients individually.



The latest improvements in Life Extension Mix are the most extensive in the product's 15-year history. The Foundation regularly receives input from physicians, scientists and knowledgeable members about ways to improve Life Extension Mix. The result is a formula that is constantly evolving to provide the user with the best that medical science has to offer.

## The Science Behind the New Life Extension Mix

Life Extension Mix makes it practical for anyone to follow a scientifically designed disease prevention program. The 1998 Life Extension Mix formula has been improved to provide protection against the mechanisms that have been implicated in the development of degenerative disease. A large textbook could be written about the health benefits of all the ingredients in the formula. Here, we will discuss only the changed ingredients in the new Life Extension Mix.

### N-Acetylcysteine

Massive free-radical damage occurs in mitochondria, the cells' energy power plants. This damage can overwhelm the cells' antioxidant defense systems; in fact, mitochondrial damage due to aging is a serious health problem in elderly people whose energy levels decline precipitously, even when they remain disease-free.

N-acetylcysteine (NAC) has been shown to stimulate glutathione production in order to provide protection against free radicals that are continuously being generated in mitochondria. In addition to protecting against mitochondrial free radical damage, NAC has been shown to reduce the damaging effect of intracellular hydrogen peroxide by 93 percent. In addition, supplemental NAC can reduce the frequency and duration of infectious diseases. NAC is used as a mucus-dissolving agent in chronic bronchitis, as an antidote for liver damage induced by acetaminophen (the pain reliever, of which Tylenol is the best-known brand name), and as an inhibitor of hemorrhagic inflammation of the urinary bladder caused by tumor-suppressing drugs.

The 1998 version of Life Extension Mix contains six times more NAC than the previous formula.

### Proanthocyanidins

The most potent natural free radical scavenger may be the proanthocyanidins found in grape seed and pine bark. Proanthocyanidins and other extracts from grape seed have been shown to inhibit abnormal blood clotting, promote the formation of collagen in the skin, and protect against cancer. Proanthocyanidin supplements have become popular because of the many health benefits this natural flavonoid provides. There is now 50 mg of grape seed-skin extract in the daily dose of the 1998 version of Life Extension Mix. The suggested dose of proanthocyanidins for healthy people ranges from 30 to 150 mg a day.

### Anthocyanidins

Published studies now document the Foundation's long-standing position that normal aging results in severe reductions in microcapillary blood flow throughout the body. Many diseases of the brain, eye and skin result from this age-related circulatory deficit. The anthocyanidins in bilberry complement the proanthocyanidins in grape seed in helping to maintain healthy blood circulation to every cell of the body.

We tripled the amount of standardized bilberry extract and added 66 percent more proanthocyanidins from grape seed in the 1998 formula.

### Silymarin

The Foundation introduced silymarin many years ago for the prevention and treatment of a wide range of liver diseases. Since then, silymarin has been approved as a drug in Germany, and new health benefits have been demonstrated for this antioxidant bioflavonoid extracted from milk thistle. We added two-and-a-half times more silymarin to the 1998 formula. Those with severe liver disease should take additional supplemental silymarin under the care of a physician.

### Selenium

One of the most important disease-preventing nutrients is selenium. While too much selenium can be toxic, it appears that most people take too little supplemental selenium out of concern about toxicity. Optimal supplemental selenium intake for healthy people ranges from 200 to 600 micrograms a day. Those with certain viral diseases or cancer can take as much as 1,000 micrograms a day of selenium without encountering toxicity.

The 1998 Life Extension Mix contains 200 elemental micrograms of two different types of selenium-double the previous dose. Many members obtain additional selenium by taking Life Extension Booster and/or Super Selenium Complex.

## TMG

In 1981, the Life Extension Foundation recommended B-complex nutrients for the purpose of lowering blood levels of the toxic amino acid homocysteine, a primary causative agent in the development of atherosclerosis, thrombosis, some forms of cognitive deficit and some cancers. It was only in 1997, however, that the rest of the world discovered the lethal dangers of homocysteine. While folic acid, vitamin B12 and vitamin B6 lower homocysteine, TMG (trimethylglycine, also known as betaine) does it better and differently. Further, some people with severely elevated homocysteine levels respond only to TMG. It is one of the most efficient methylation- enhancing nutrients.

Nuclear DNA loses methyl groups as a part of normal aging. Each molecule of TMG donates three methyl groups to the cell's DNA. This re-methylation process helps to rejuvenate cells and lowers toxic homocysteine levels by inducing its conversion into methionine and S-adenosylmethionine (S-AMe). Thus, abnormally low plasma levels of methionine and S-AMe are raised, while homocysteine is lowered. In one study, it was found that "prolonged betaine treatment, taken with concurrent vitamin B6 and folic acid therapy, maintained its initial promise of lowering plasma homocysteine concentrations substantially in all patients."

The decrease in plasma homocysteine by means of re-methylation can be maintained as long as TMG is taken. TMG is very hygroscopic (absorbs water), and only 100 mg of it can be put into Life Extension Mix without risking disintegration of the capsule or tablet. Since 100 mg of TMG will provide only a limited amount of homocysteine reduction and DNA methylation, you should consider taking an additional 500 mg of TMG every day.

## Anti-Glycosylation Nutrients

The glycosylation of proteins has been shown to play a prominent role in the development of many diseases related to diabetes, including atherosclerosis, cataract formation and retinopathy. Some scientists believe that glycosylation is a major cause of premature aging. Diabetics, who have greatly accelerated rates of glycosylation, suffer from the early onset of several degenerative diseases. The most potent clinical agent in inhibiting glycosylation is a drug called aminoguanidine. While this may be available from European suppliers, it has been difficult for many members to bring in into the United States.

Some studies show that vitamin C, vitamin E and chromium inhibit glycosylation to a limited degree. Investigations have been conducted to explore the possibility of preventing glycosylation by the use of pyruvate and alpha-ketoglutarate. The results demonstrate that both these compounds are effective in preventing the initial glycosylation reaction as well as the formation of eye disease.

Both pyruvate and alpha-ketoglutarate inhibit the generation of high molecular-weight aggregates associated with cataract formation. These preventive effects appear to be due to competitive inhibition of glycosylation by the keto acids, as well as by the antioxidant properties of these compounds. These agents may be useful in preventing glycosylation-related protein changes and consequent tissue-pathological manifestations associated with cataract, diabetes and normal aging. The daily dose of the 1998 formula provides sufficient amounts of calcium pyruvate and ornithine alpha keto-glutarate for healthy people. Diabetics should consider taking three times as much of these anti-glycosylation nutrients.

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taking any medication, or if you have or suspect you might have a health problem. You should not stop taking any medication without first consulting your physician.