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REPORT



Unique New Combination Ginkgo and Phosphatidylcholine

Phosphatidylcholine is the most active ingredient found in soy lecithin. Every cell membrane in the body requires phosphatidylcholine (PC). Nerve and brain cells in particular need large quantities of PC for repair and maintenance. PC also aids in the metabolism of fats, regulates blood cholesterol, and nourishes the fat-like sheaths of nerve fibers.

PC is a major source of the neurotransmitter acetylcholine. Acetylcholine is used by the brain in areas that are involved in long-term planning, concentration and focus. Acetylcholine controls the rate of stimuli entering the brain, motor activity, learning and memory, stimuli input during sleep, sex, and other functions.

Supplemental PC increases the amount of acetylcholine available for memory and thought processes. Increasing acetylcholine levels has been shown to improve performance by humans in a variety of intelligence and memory tests. Acetylcholine also is extremely important in maintaining brain cell structure.

How Brain Cells Communicate

Neurons communicate with each other through structures called synapses. When a neuron transmits an impulse to another neuron, the synapse releases a transmitter chemical. Forty-two percent of the fat chemicals in brain synapse membranes consist of phosphatidylcholine.

Acetylcholine is one of the neurotransmitters that brain cells use to communicate with each other. Aging causes a decline in synaptic junctions, dendrite branches, and in the levels of neurotransmitters such as acetylcholine.

Aging impairs the brain's ability to make acetylcholine. Aging also causes an increase in enzymes that destroy acetylcholine. Acetylcholine deficiency is one cause of age-related memory and cognitive deficits. Supplemental choline, and phosphatidylcholine help to make up for the deficit in acetylcholine. A choline deficiency can also be associated with high cholesterol levels, some types of cardiac symptoms, skin problems such as psoriasis, poor tolerance of dietary fats, gastric ulcers, high blood pressure, gall stones, and liver disease. Newborn children have extremely high choline levels in their blood. This seems to be necessary for the manufacture of myelin, which is the material that insulates and protects the nervous system.

Behavior and Memory



Numerous studies have demonstrated that dietary supplementation with choline increases central cholinergic activity. In a study to evaluate the effects of dietary choline, mice were given a diet rich in choline, trained for passive avoidance tasks, and tested for retention either 24 hours or five days later. Their performance was compared with mice that were maintained on a control diet. The results were that the choline-enriched mice (13 months old) performed as well as 3-month-old mice, whereas the choline-deficient mice performed as poorly as senescent mice (23 months old).

A study of 10 normal, healthy volunteers established the effect of a single oral dose of choline on two kinds of memory. One was a test of short-term memory. The other was a test that measured the ability to remember concrete words like "table" versus abstract words like "truth." The test found an increase in short-term memory when members of the group were tested after being given choline. In addition, the ability to remember abstract words was improved.

In one double-blind study, students at Massachusetts Institute of Technology, in Boston, were given 3 grams of choline a day. They showed improved memory performance, learning longer lists of words than control students receiving placebo (inactive substance). (Double blind means that neither the person administering the drug nor the subjects know whether any particular subject is receiving placebo or active material. This helps to prevent expectations from altering how people perceive the effects of the treatment.)

In another study, a single 10-gram dose of choline improved the ability to learn lists of words. Similar results were obtained in a human study in which subjects were given 80 grams of lecithin.

A group of Italian scientists provided evidence that choline may improve other brain functions in addition to acetylcholine metabolism. They looked at the cerebellum of the brain in aged mice receiving extra choline in their diet. Neurons in the cerebellum, which controls body coordination, usually don't use acetylcholine as a transmitter. They found that the number of synaptic contacts went down significantly in old mice. They also found that the length of these synapses increased significantly in aged mice. However, in experimental mice fed choline throughout their lives, there was no deterioration in the number of synapses with aging. Since the cerebellum controls body coordination, the deterioration of synapses in the cerebellum could explain the loss of coordination with advancing age.

This study suggests that taking extra choline throughout your life could help to prevent this loss of coordination, and that aging involves a loss of membrane function in nerve cells, with the membranes becoming more fluid as we age.

Diseases Treated with Phosphatidylcholine

Choline and lecithin phosphatidylcholine have been used with some success in treating Huntington's disease, tardive dyskinesia, Parkinson's disease, and other diseases of the nervous system. Choline and lecithin are also used therapeutically to treat diabetes, gall bladder problems, liver disorders, muscular dystrophy, glaucoma, arteriosclerosis, senility, and memory problems.

Older brains tend to shrink. The study suggests that taking extra choline throughout life could help to prevent loss of coordination. show a higher lipofuscin ("age pigment") content, and exhibit the characteristic signs of senility-neuritic plaques and neurofibrillary tangles. Although the brains of elderly non-demented people aren't as deteriorated as those who have senile dementia, there is some degree of deterioration in every aging brain. These findings suggest that almost all aged people suffer to some extent from at least a mild form of senile dementia. A significant percentage of people over age 65 suffer from pervasive memory loss.

The Need for Supplemental Phosphatidylcholine

Food contains only trace amounts of free choline. Most of the choline normally present in our diet is in the form of lecithin where it occurs in seed oils and in unrefined foods containing oil.

Few people obtain enough choline and phosphatidylcholine through their diet. That's why lecithin supplements have been so popular. A new supplement has been designed that combines phosphatidylcholine with ginkgo to provide two highly effective nutrients for the brain.

Ginkgo's Neurological Benefits

Ginkgo has become one of the most popular dietary supplements in the United States. Several well publicized studies in 1997 documented the ability of ginkgo to improve memory in healthy people and in those with neurological disease. There are now over 1,000 published studies about ginkgo, some that indicate that this potent flavonoid may have anti-aging effects throughout the body.

Ginkgo biloba extract is the most commonly prescribed plant remedy in the world. It has powerful therapeutic properties for the treatment of a number of serious medical conditions, including Alzheimer's disease, asthma, impotence, tinnitus and hearing loss, headaches, circulatory disorders and hemorrhoids. Ginkgo has been a staple of Chinese herbal medicine for thousands of years. It is one of the components of an elixir called Soma, which is a traditional Hindu medicine.

Ginkgo increases blood flow throughout the brain, leading to increased uptake of oxygen by nerve cells. It extends the ability of brain cells to withstand periods of oxygen deprivation, thus making it useful in treating strokes. It also protects cells against damage caused by exposure to toxins. Ginkgo protects small blood vessels against spasm and loss of tone, has a relaxing effect on the vessel wall, and protects capillaries from becoming fragile or leaking blood into tissues. It also acts to prevent the abnormal development of blood clots inside arteries and veins.

The clinical uses of ginkgo have included the treatment of early stroke, senility and radiation-induced brain edema. Other disorders that have benefitted from ginkgo include vertigo, deafness, embolism and some eye disorders including dry macular degeneration

and diabetic vascular disease. Ginkgo has brought about statistically significant increases in alertness and mental responsiveness in healthy people, especially at higher doses. For example, in a study of 216 patients who were treated for 24 weeks with 240 mg a day of ginkgo extract or placebo, the patients receiving ginkgo improved on tests assessing attention, memory, behavior and activities of daily life.

For the past several years, ginkgo has been widely prescribed in Europe for age-related organic brain impairment, auditory and visual difficulties, and cerebral and peripheral circulatory disorders. It has been approved by the German government to treat dementia, to improve circulation in people with blocked arteries in their legs; and to reduce dizziness and ringing in the ears caused by inner-ear disease. There is no indication that ginkgo negatively interacts or affects any of the other medications taken concurrently. It is a top-selling therapy in Germany, with more than 5 million prescriptions filled each year.

Ginkgo Extract's Unique Composition

Standardized ginkgo is a highly refined compound produced from the leaves, nuts and branches of the ginkgo tree. Pharmaceutical-grade ginkgo consists of 24 percent flavonoid glycosides, (which is said to be the optimum for obtaining its therapeutic effects) and at least 6 percent of the terpenes ginkgolides A, B and C and bilobalide. A number of other constituents make the extract soluble. The flavonglycosides, which are part of the bioflavonoid family, are flavonoid molecules that are unique to ginkgo.

This standardized mixture of biologically active natural products gives the entire extract a complex range of activity. For example, the flavonoids act as free radical scavengers and the terpenes, particularly ginkgolide B, apparently interfere with or block the action of platelet activating factor (PAF, which has been implicated in abnormal platelet aggregation, asthma, graft rejection and immune disorders such as toxic shock syndrome).

Both free radical formation and PAF can disrupt vascular membranes, resulting in increased vascular permeability, which, in turn, is associated with the impairment of cerebral blood flow seen with aging. In addition to limiting membrane damage, Ginkgo biloba extract appears to affect other factors which contribute to cerebral insufficiency, including disruption of vascular tone, altered cerebral metabolism and disturbances in neurotransmitters and their receptors.

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Alzheimer's Disease

Ginkgo biloba extract appears to delay mental deterioration during the early stages of Alzheimer's disease. In fact, Ginkgo biloba extract may help to reverse some of the disabilities associated with Alzheimer's and help the patient maintain a normal life without having to be hospitalized.

A study in the Oct. 22, 1997, issue of the Journal of the American Medical Association concluded that Ginkgo biloba extract alleviated symptoms associated with a range of cognitive disorders, and was beneficial in the treatment of dementia. The study added that Ginkgo biloba extract "was safe and appears capable of stabilizing and, in a substantial number of cases, improving the cognitive performance and the social functioning of demented patients for six months to one year." The benefits were said to be "as dramatic as Tacrine or Aricept, two prescription drugs that have been approved to slow the dementia of Alzheimer's." The advantages of ginkgo over Tacrine and Aricept are that there seems to be no side effects, it's available as a supplement, and is cheaper than prescription drugs.

Ginkgo's Multiple Talents

Ginkgo biloba appears to have positive effects on a wide variety of disorders. In a 1975 study, ginkgo extract was given to patients suffering from migraine headaches, with improvement or almost total cure in 80 percent of the cases (for patients with other types of headaches, the results were not as definitive).

One of the most promising uses of the ginkgolides may be as a less-toxic alternative to the immunosuppressive drug cyclosporin to suppress immunity during organ transplants, according to Dr. Richard W. Ramwell of Georgetown University Medical School, in Washington, D.C. In experimental heart transplants using different strains of laboratory rats, Ramwell and surgery professor Marie Foegh found that ginkgolide B prolonged the survival of grafted hearts in recipient rats. Without ginkgo extract, the animals' immune systems would have quickly rejected their new hearts. Because of this experiment, Dr. Ramwell is confident that the Ginkgo may be useful in human transplant surgery.

In addition, he says, other animal studies suggest that ginkgolide B might be effective in regulating blood pressure, treating kidney disorders and various forms of shock, reducing inflammation, treating eye diseases and serving as an antidote for a number of

toxins.

Ginkgo also has an effect on asthma. A condition that often develops in childhood, asthma is a lung disease in which overactive bronchial tubes narrow, swell, and become clogged with mucus. During an attack, the asthmatic has difficulty inhaling fresh air and exhaling spent air.

In animal tests, bronchoconstriction has been inhibited in the presence of ginkgolides, which are antagonistic to platelet activating factor. Several other studies have confirmed these results and suggest a therapeutic role for Ginkgo biloba extract in the management of asthma.

Ginkgo has been shown in open trials to be an effective therapeutic agent in patients with dizziness, vertigo and tinnitus (ringing in the ears). In one study, ginkgo, administered orally in divided doses of 60 to 160 mg a day, produced resolution or marked improvement in symptoms in 40 to 80 percent of the volunteers treated, compared with those receiving placebo. The extract has been especially successful in treating patients with vestibular neuronitis, or an inflammation of inner ear nerve cells. There was an overall success rate of 85 percent when researchers treated 49 patients afflicted with vertigo and various stages of hearing loss with ginkgo. They recommend the extract for neurosensory diseases of the inner ear, which have such vascular origins as headaches and vertigo.

Since ginkgo has been used successfully for blood pressure regulation and various vascular diseases, it should come as no surprise that ginkgo is beneficial in dealing with sexual impotence in males. During an erection, the penis becomes engorged with blood as blood vessels enlarge or dilate to allow increased blood flow. This change is due to nerve stimulation. Since some nerves are controlled in the brain, drugs that affect the brain can have an effect on erection. A 1989 study illustrates this. Sixty patients with arterial erectile dysfunction who had not responded to papaverine injections (one of the vasodilators that physicians prescribe to increase blood flow in the penis) were treated with Ginkgo biloba extract. Some improvement was reported in six to eight weeks. The dosage was 60 mg a day. Following six months of therapy with ginkgo, 50 percent of the patients were able to sustain penile erections, and 25 percent demonstrated improved arterial blood flow. About 45 percent of the remaining men noticed some improvement in achieve erections, especially after being given the supplement in conjunction with papaverine. Papaverine is not recommended for those with angina, glaucoma, heart disease, myocardial infarction, an a recent stroke. It is also not recommended for Parkinson's patients, especially those taking levodopa, and its effectiveness can be diminished by cigarette smoking.

In peripheral artery disease, the reduction of blood flow induces a hypoxic (lack of oxygen) event that increases the production of toxic metabolites and cellular free radicals. A six-month clinical trial in Germany found that ginkgo improved the distance patients could walk without pain by 100 percent in the test group, versus 30 percent in the controls. A 1965 study reported that Ginkgo biloba extract lowered blood pressure and dilated or expanded the peripheral blood vessels, including capillaries in 10 patients with post-thrombotic syndrome.

A 1977 study with ginkgo on cerebral blood flow was conducted in 20 patients, aged 62 to 85, who were diagnosed with cerebral circulatory insufficiency due to age and hardening of the arteries. The patients were treated orally and tramuscularly for 15 days. Because of the age and health of the volunteers, the researchers maintained low dosages of ginkgo and did not expect spectacular results. However, they reported that the cerebral hemodynamics was much improved in 15 of the cases. One of the leading causes of blindness in people over 65 is macular degeneration. Blood deficiency causes degeneration of the macula, and blurring of central vision follows. Because of their free radical scavenging properties, vitamin A, vitamin C and Ginkgo biloba extract have been studied as possible deterrents to macular degeneration.

In 1986, French researchers administered Ginkgo biloba extract to 20 elderly patients with recently diagnosed macular degeneration. Distant visual acuity in the most affected eye improved by 2.3 diopters (a measure of refraction power) in Ginkgo biloba recipients, while in placebo patients the mean increase was only 0.6 diopters.

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