

- Topics:** Phosphatidylserine (PS), phosphatidylcholine (PC), Ginkgo biloba, cognitive performance, age related cognitive decline, dementia, memory
- Objective:** To assess the comparative cognitive and mood enhancing effects of a low dose of Ginkgo biloba Extract (GBE) alone and in combination with either PS or PC.
- Background:** Previous studies have shown that daily doses of 120 mg GBE may improve cognitive decline associated with aging and dementia and improve cognitive performance in healthy young and old adults. It has been suggested that both PC and PS could enhance brain function in those with pathological conditions such as dementia based on their known physiological role in brain and nerve function. It is possible that any beneficial effects associated GBE may be enhanced by improved bioavailability in association with either PS or PC.
- Method:** This placebo-controlled, multi-dose, double-blind, balance-crossover study included 28 healthy young (mean age 20.4 years) volunteers receiving a single dose of 120 mg GBE, 120 mg GBE complexed with PS and 120 mg GBE complexed with PC and a matching placebo on separate days 7 days apart. Cognitive performance was assessed using the Cognitive Drug Research computerized test battery and Serial Subtraction tasks immediately prior to dosing and at 1,2.5, 4 and 6 h thereafter.
- 1.Primary outcome measures were:
 - Speed of Attention
 - Speed of Memory
 - Accuracy of Attention
 - Secondary Memory – delayed word recognition, immediate word recall and delayed word recall
 - Working Memory - spatial working memory and numeric working memory
 - Quality of Memory - Combined scores of Secondary Memory and Working Memory
 - 2.Other measures included:
 - Mathematical performance test
 - Subjective mood measure – alertness, calmness and contentedness
- Plasma levels of terpenoids (actives and markers derived from GBE) were quantified at pre-dose and at 3 and 6.5 hours post-dose.
- Findings:** 120 mg of GBE alone failed to significantly enhance cognitive performance. GBE complexed with PC also failed to elicit performance benefits. However, GBE complexed with PS significantly improved accuracy of memory and most notably increased speed of memory task performance. All treatments were well tolerated and no adverse events were reported.
- Conclusion:** PS enhances the cognitive benefits associated with low dose GBE in normal healthy adults.
- Relevance to:** Efalex Active 50+
- Reference:** Kennedy DO, Haskell CF, Mauri PL, Scholey AB. Acute cognitive effects of standardized Ginkgo biloba extract complexed with phosphatidylserine. *Hum Psychopharmacol Clin Exp* 2007;22:199-210.

PRESS RELEASE**Ginkgo biloba Combined with Phosphatidylserine Enhance Brain Function**

A recent study completed in the Neuroscience Unit of the University of Northumbria, Newcastle upon Tyne, UK has shown that combining phosphatidylserine (PS) supplementation with a Ginkgo biloba extract (GBE) may enhance its brain performance effects in normal, healthy adults¹.

The double-blind, placebo-controlled study was designed to compare cognitive and mood enhancing effects of a low dose (120 mg/day) of GBE alone and in combination with either PS or phosphatidylcholine (PC). PS and PC are both naturally occurring food derived phospholipids that may enhance brain function in people with conditions such as age related cognitive decline and dementia. The study included 28 healthy volunteers (mean age 20.4 years) who were each provided with a single dose of all the test combinations on separate days seven days apart: 120 mg GBE; 120 mg GBE combined with PS; 120 mg GBE combined with PC; or placebo. Cognitive performance was measured before taking each treatment and at 1, 2.5, 4 and 6 hours following supplementation. The primary outcome tests included measures of speed of attention, speed of memory, accuracy of memory, secondary memory (delayed word recognition, immediate word recall and delayed word recall), working memory (spatial working memory and numeric working memory), and quality of memory (combined scores of secondary memory and working memory). Other measures included mathematical performance tests, and subjective mood measures (alertness, calmness and contentedness). Plasma levels of actives and markers derived from GBE were quantified at pre-dose and at 3 and 6.5 hours post-dose to confirm their bioavailability.

GBE alone or in combination with PC failed to significantly enhance cognitive performance. However, GBE complexed with PS significantly improved accuracy of memory and most notably increased speed of memory task performance.

This study is significant because it is the first to show that combinations of GBE and PS are safe and effective brain enhancers in healthy adults and that PS can enhance the effectiveness of GBE. Previous studies have reported that individually, GBE may prevent further deterioration in Alzheimer's disease, multi-infarct and mixed dementia². For example, in 1462 normal elderly women who were given GBE for at least 2 years and followed for seven years, there was a statistically significantly lower risk of developing Alzheimer's disease³. At least 16 clinical trials using PS alone to treat either dementia or impaired cognitive function have been published⁴. Results range from modest to substantial improvements in various memory functions, learning, concentration, word skills and mood that all enhance quality of life in patients with active and often severe mental deterioration. Based on the results of this new study in healthy adults, one could imagine that GBE + PS may also produce more significant improvements in people with cognitive decline compared to either treatment on its own.

References:

1. Kennedy DO, Haskell CF, Mauri PL, Scholey AB. Acute cognitive effects of standardized Ginkgo biloba extract complexed with phosphatidylserine. *Hum Psychopharmacol Clin Exp* 2007;22:199-210.
2. Bibzan L, Biliakiewicz A, Turczynski J. Preliminary assessment of Ginkgo biloba (Ginkofar) in patients with dementia. *Psychiatr* 2005 May-Jun;39(3):559-66.
3. Andrieu S, Gillette S, Amouyal K, Nourhashemi F, Reynish E et al. Association of Alzheimer's disease onset with Ginkgo biloba and other symptomatic cognitive treatments in a population of women aged 75 years and older from the EPIDOS study. *J Gerontol A Biol Sci Med Sci* 2003 Apr;58(4):372-7.
4. <http://www.cfsan.fda.gov/~dms/ds-ltr36.html>