



Ginkgo

What is ginkgo?

Ginkgo or *Ginkgo biloba* is one of the world's oldest living tree species. Ginkgo has been used for many years for a variety of medicinal purposes.

What is ginkgo extract?

Ginkgo extract is made from the leaves of the *Ginkgo biloba* tree. The leaves contain a complex mixture of components. The exact formulation of ginkgo extract in products available to consumers in the U.S. can vary from manufacturer to manufacturer.¹

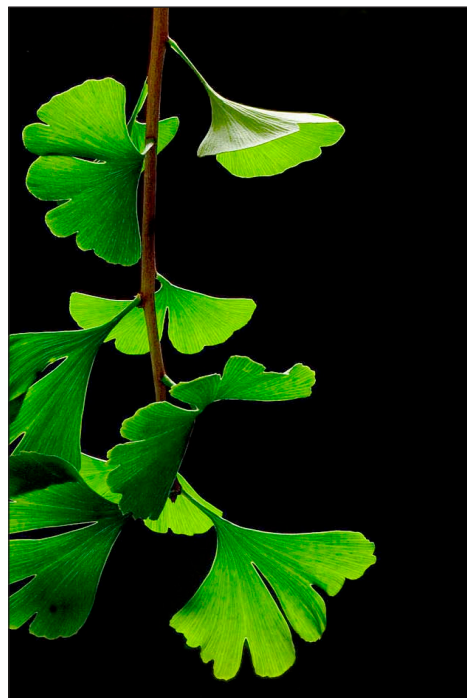
Why do some people take ginkgo extract?

In the U.S., ginkgo extract is readily available to consumers as an herbal supplement. People take it for a wide variety of health reasons, mostly to improve brain function and memory. However, clinical trials designed to assess the efficacy of ginkgo extract have not produced consistent evidence of benefit.

Ginkgo extract is typically taken orally. It is found in capsules, tablets, or teas, but may also be available in liquid extracts.

Is ginkgo extract regulated?

Ginkgo is marketed in the U.S. as a dietary supplement and regulated by the U.S. Food and Drug Administration (FDA). In general, the FDA regulations for dietary supplements are different from regulations for prescription



or over-the-counter drugs. Federal law does not require dietary supplements to go through the same standards of premarket testing for safety or efficacy as drugs intended to treat, cure, prevent, diagnose, or mitigate disease.

Why did the NTP study ginkgo extract?

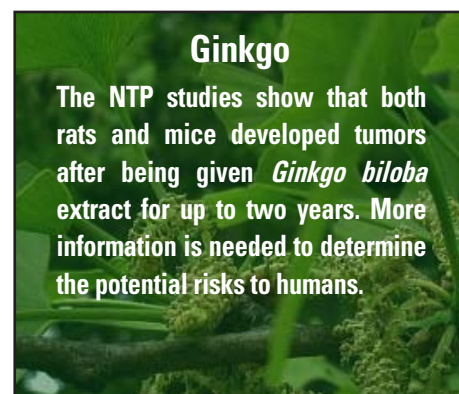
The nomination to study ginkgo extract came from the National Cancer Institute (NCI) because of its widespread use as an herbal supplement and the limited data on toxicity and carcinogenicity. The ginkgo studies are part of a larger NTP initiative to evaluate the safety of a number of widely used herbal products.

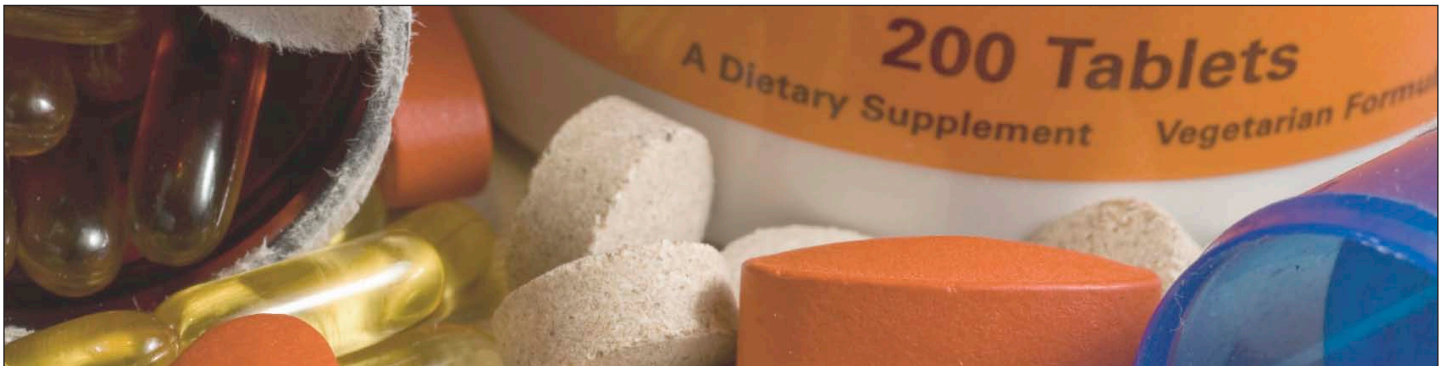
What did the NTP toxicity and carcinogenicity studies find?

The NTP looked at the long-term effects of ginkgo extract in mice and rats. Ginkgo extract was given orally to the animals for up to 105 weeks. At the end of the two-year studies, the NTP found an increase in liver cancer in male and female mice, and in cancer of the thyroid gland in male and female rats and male mice.

What do the NTP studies mean for humans?

The NTP rodent studies on ginkgo extract may be relevant to humans. However, these studies represent only the first step in determining if there is a human cancer risk from taking ginkgo extract as a dietary supplement. The next steps will include identification of components in the extract that may account for the cancer findings, along with the collection of additional information on human consumption of ginkgo extract.





NTP works closely with the FDA to conduct research studies to address questions about the safety of a wide variety of dietary supplements.

What have some other major NIH-supported research studies looking at the health benefits of ginkgo found?

In the largest clinical trial of ginkgo to date, researchers supported by the National Institutes of Health (NIH) looked at data on more than 3,000 people, ages 75 or older, between 2000 and 2008. Half took ginkgo, half did not. All participants in the Ginkgo Evaluation of Memory (GEM) study took tests of their thinking abilities. The researchers found that 120 milligrams taken twice daily was not effective in reducing the incidence of dementia, lessening cognitive decline, reducing blood pressure or hypertension, or reducing cardiovascular disease events.^{2,3} NIH is also supporting additional research studies on ginkgo.

Should I stop or start taking ginkgo extract?

Consumers should be aware that studies have not consistently demonstrated that ginkgo improves brain function. The new NTP findings showing that both rats and mice develop cancer after long-term use should also be taken into consideration. Additionally,

ginkgo has been shown to interact with other drugs, which can increase or decrease their effects.⁴ It is always important to give your health care provider a full picture of what you do to manage your health, including taking dietary supplements. This will help ensure coordinated and safe care.



Where can I find out more about ginkgo?

National Toxicology Program

http://ntp.niehs.nih.gov/NTP/About_NTP/TRPanel/2012/February/DraftTR578.pdf

NIH National Center for Complementary and Alternative Medicine

<http://nccam.nih.gov/health/ginkgo/ataglance.htm>

<http://nccam.nih.gov/health/supplements/wiseuse.htm>

NIH Office of Dietary Supplements

<http://ods.od.nih.gov/factsheets/botanicalbackground/>

http://ods.od.nih.gov/healthinformation/DS_WhatYouNeedToKnow.aspx

U.S. National Library of Medicine

<http://www.nlm.nih.gov/medlineplus/druginfo/natural/333.html>

U.S. Food and Drug Administration

<http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/ucm050824.pdf>

U.S. Department of Health and Human Services

<http://www.hhs.gov/news/healthbeat/2010/01/20100106a.html>

¹ Kressmann S, Müller WE, Blume HH. 2002. Pharmaceutical quality of different Ginkgo biloba brands. *J Pharm Pharmacol* 54(5):661-669.

² DeKosky ST, Williamson JD, Fitzpatrick AL, Kronmal RA, Ives DG, Saxton JA, Lopez OL, Burke G, Carlson MC, Fried LP, Kuller LH, Robbins JA, Tracy RP, Woolard NF, Dunn L, Snitz BE, Nahin RL, Furberg CD; Ginkgo Evaluation of Memory (GEM) Study Investigators. 2008. Ginkgo biloba for prevention of dementia: a randomized controlled trial. *JAMA* 300(19):2253-2262.

³ NCCAM Research Spotlights

⁴ Abad MJ, Bedoya LM, Bermejo P. 2010. An update on drug interactions with the herbal medicine Ginkgo biloba. *Curr Drug Metab* 11(2):171-181.