



HerbClip™

Shari Henson
Heather S Oliff, PhD

Brenda Milot, ELS

John Neustadt, ND4
Densie Webb, PhD

Executive Editor – Mark Blumenthal *Consulting Editors* – Dennis Awang, PhD, Steven Foster, Roberta Lee, MD

Managing Editor – Lori Glenn

Funding/Administration – Wayne Silverman, PhD *Production* – George Solis/Kathleen Coyne

FILE: ■ Asian Ginseng (*Panax ginseng*)
■ Cancer Prevention
■ Cancer Therapy

HC 110342-276

Date: March 15, 2005

RE: Role of Asian Ginseng in the Prevention and Treatment of Cancer

Helms S. Cancer prevention and therapeutics: *Panax ginseng*. *Altern Med Rev*. 2004;9(3):259–274.

Panax ginseng, commonly known as Asian or Korean ginseng, has been used medicinally by eastern Asians for at least 2,000 years. This plant is currently cultivated throughout the world for the treatment of many conditions (e.g., diabetes, cancer, and cardiovascular disease) and appears in the pharmacopoeia of many countries, including those of China, Japan, Germany, Austria, and the United Kingdom. In the year 2000, Asian ginseng was the second-highest selling herbal supplement in the United States. In Western countries, research is currently focused on the potential use of this herb in treating and preventing cancers.

The active components of Asian ginseng include saponins, polysaccharides, flavonoids, and volatile oils. The saponins and polysaccharides are the two constituents that have been the greatest focus of investigation. Acidic polysaccharides, which have a molecular weight of 10,000–150,000, have been shown to have immunomodulating and antiproliferative effects in tumor cell lines. The primary saponins, otherwise known as ginsenosides, and their metabolites have a steroid-like structure; 28 ginsenosides have been identified in ginseng (e.g., compound K, Rh1, Rb1, Rc, Rd, Rg, and Re). The concentrations of these active components vary depending on the type (fresh, red, and white) and age of the ginseng preparation.

The development of cancer begins with a rapid (hours to days) initiation phase, during which irreversible DNA changes occur. The pathogenesis proceeds to a slower promotion phase, which may take years or even decades, during which time an actively proliferating premalignant lesion develops and progresses. The resultant effects include the inability of the affected cells to induce apoptosis (programmed cell death) and to communicate intercellularly; this condition is known as chemotolerance. Chemotolerance indicates the time at which the success of cancer-combative strategies such as chemotherapy, radiation, and immune defenses are impeded.

The mechanisms whereby Asian ginseng is thought to have a potential role as a cancer preventive and treatment agent include the mitigation of DNA damage, anti-inflammatory carcinogenesis, antioxidant chemoprevention, apoptosis induction, inhibition of cancer cell proliferation, and immunomodulation. Studies have shown the capability of ginseng to repair and reverse cell differentiation in hepatoma, melanoma, and adenocarcinoma cells. The antioxidant activities of Asian ginseng help explain its DNA-preserving qualities with respect to chemical carcinogens. Rb1 metabolites have been shown to promote apoptosis. Furthermore, Asian ginseng has been shown to reduce lung metastasis in two metastatic tumor cell lines: colon 26-M3,1 and B16-BL6 melanoma. However, another study noted an increase in the metastatic potential of Asian ginseng in an experimental cell line. No direct evidence has confirmed the immunomodulation potential of Asian ginseng.

Asian ginseng has shown promise in the treatment of several specific types of cancer, including leukemia, melanoma, and colon, gastric, hepatic, kidney, ovarian, prostate, and pulmonary cancers. Most studies have been conducted in rodents; however, survival and postoperative immunity were improved in gastric cancer patients after reported doses of 4.5 g red ginseng daily for six months after surgery. Asian ginseng has also been evaluated as an adjunctive therapy with radiation and chemotherapy. Mice pretreated with polysaccharide ginseng extracts before radiation survived a radiation dose 45% more intense than that received by controls. Also, the delivery and action of chemotherapeutic agents have been shown to be enhanced by Asian ginseng and some of its metabolites.

The results of clinical trials suggest that the adverse effects associated with recommended doses of Asian ginseng are no greater than those of placebo. Furthermore, Asian ginseng is unlikely to result in unwanted pharmacokinetic interactions because its consumption does not induce cytochrome P450 activity—a drug-metabolizing enzyme. The recommended doses of Asian ginseng are 1–2 g of crude drug or 200–600 mg of standardized extracts (calculated to 4–7% ginsenosides).

The anti-inflammatory and antioxidant activities of Asian ginseng are the reasons why this herbal supplement is thought to have a role as an anticancer agent. Although there is no conclusive proof that Asian ginseng cures cancer, existing evidence indicates that ginseng has the ability to "slow growth as well as to enhance the ability of the immune system and tumor cells to overcome chemotolerance and incite apoptosis." Thus, the promotion phase of cancer may provide the best target for cancer prevention with Asian ginseng because the initiation and progression phases are generally considered to be irreversible. Asian ginseng is already well accepted as a treatment for cancer in China. However, research in the West has been limited. As scientific experimentation progresses in the United States, the potential use of Asian ginseng in cancer therapeutics and prevention will continue to be investigated.

—*Brenda Milot, ELS*

Enclosure: Reprinted with permission from *Alternative Medicine Review*. PO Box 25. Dover. Idaho. 83825.

The American Botanical Council provides this review as an educational service. By providing this service, ABC does not warrant that the data is accurate and correct, nor does distribution of the article constitute any endorsement of the information contained or of the views of the authors.

ABC does not authorize the copying or use of the original articles. Reproduction of the reviews is allowed on a limited basis for students, colleagues, employees and/or members. Other uses and distribution require prior approval from ABC.