New Protection from Cancer?

A broccolli-based supplement may show promise for cancer patients.

By Nicholas Studholme, DC

We all remember Benjamin Franklin's words, "An ounce of prevention is worth a pound of cure." Our familiarity with this concept does little to affect our approach to cancer, however. Most people only change their lifestyle once they are diagnosed with cancer. I routinely joke with patients that no one is interested in reading a book describing how not to get cancer; instead, they want to read the book that has an amazing cancer survival story.

Some estimates show that as many as two-thirds of all cancers may be environmentally, and not genetically, induced. This potentially means that we may affect cancer incidence through eating more fruits and vegetables and maintaining healthy lifestyles. And yet all of us trying to get patients to eat more vegetables know how difficult this can be.

A New Option

Although it does not replace eating real food, sulforaphane glucosinolate, or SGS™, a compound found in sprouts grown from certain varieties of broccoli, shows promise in cancer prevention and treatment. Each 30-mg capsule of SGS has approximately the nutritional equivalent of 1¼ pounds of broccoli. SGS may have an effect on the treatment and prevention of prostate, breast, lung and colon cancers—the four most prevalent cancers in the United States. In addition to cancers, this nutrient may be a factor in preventing high blood pressure, macular degeneration, cholesterol, and stomach ulcers linked to *Helicobacter pylori*.

Mechanism of Action

SGS has been shown to function as an indirect antioxidant. This differs from direct antioxidants such as vitamins C and E or beta-carotene, which work by quenching free radicals one at a time and are consumed in the process. Conversely, indirect antioxidants function by up-regulating phase 2 liver enzymes, which typically detoxify a wide array of free radicals. Indirect antioxidants can have an effect on this up-regulation that may last for days even after they have left the body. Curcumin from turmeric is another example of an indirect antioxidant.[1]

Much of the research on SGS has been done at Johns Hopkins University School of Medicine, which owns the SGS trademark. According to Dr. Talalay, a leading researcher at Johns Hopkins, "These enzymes act as a defense mechanism, triggering broad-spectrum antioxidant activity that neutralizes many free radicals, cycling over and over again before [the free radicals] can cause the cell damage that may cause mutations, leading to cancer."

SGS Availability

Any trip to your local vitamin store will show you a wide array of companies selling SGS. However, since there is no regulation of supplements in the United

States, we have to exercise caution when we buy any supplement. I have no affiliation with a specific nutrition company, but it is my current understanding that only Xymogen has an exclusive partnership with Johns Hopkins to sell SGS, which is the form of sulforaphane currently used in a majority of the studies. Johns Hopkins has sold its old technology to Conagra, but has since enhanced its technology and has been able to get a higher-yield extract from SGS.

The current suggested prophylactic dosage is 30 mg to 50 mg of SGS per day. In patients with cancer, the dose can be increased to 100 mg a day. There is no known case of overdosing and, as the supplement is derived from broccoli, it appears to have no known drug or supplement interactions. ■

Reference

1. *Mol Nutr Food Res* 2008 Jun;52 Suppl 1:S128-38.

Some of the Latest SGS Research

- "Sulforaphane may be a promising therapeutic approach for the treatment of cancers, including those characterized by increased inflammation". (*Cancer Lett* 2006 Feb 28;233(2):208-18 Oregon State University).
- "There was a 95.5% inhibition of lung tumor nodule formation and a 94.06 increase in lifespan or tumor bearing animals. These findings suggest that sulforaphane reduced the invasion of melanoma cells thereby inhibiting lung metastasis." (*Life Sci*, 2006 May 22;78(26):3043-50)
- "The results of the present study indicate that sulforaphane induced cell death in prostate cancer cells." (*J Biol Chem* 2005 May 20; 280(20):19911-24 University of Pittsburgh Cancer Institute)
- "Sulforaphane is a potent and promising naturally occurring dietary cancer chemoprotective compound that exerts its cancer protective effects by the induction of phase 2 detoxification." (*Cancer Lett.* 2006 Mar 2: Rutgers University)
- "Sulforaphane potently induces phase 2 enzymes in bladder tissues and should be investigated as a bladder cancer preventive agent." (*BMC Cancer* 2006 Mar 15;6:63 Stanford School of Medicine)
- "Sulforaphane is known to induce phase 2 detoxification enzymes, disrupt cancer cells, and trigger cell cycle arrest in breast and colon cancer cells." (*Vascul Pharmacol.* 2006 Jul 14 University of Georgia)
- "We observed potent antiproliferative effects of sulforaphane on human ovarian cancer cell lines." (*Mol Cancer Ther.* 2007 Jan;6(1):334-4)
- "Our data indicate that sulforaphane derived from broccoli suppresses the invasive potential of human MDA-MB-231 breast cancer cells in vitro. The inhibitory effects observed in the current study may contribute to the suppression of carcinogenesis by diets high in cruciferous vegetables." (*Toxicol Appl Pharmacol.* 2005 Dec 1;209(2):105-13)
- "Researchers have discovered that sulforaphane can halt human breast cancer cells in their tracks and have identified a new mechanism of action for the compound." (*Drug Discov Today.* 2004 Nov 1;9(21):908)
- "Sulforaphane (SFN) is a biologically active phytochemical found abundantly in broccoli. SFN has been promoted as a putative chemopreventive agent to reduce cancer, and most studies have associated its anti-cancer effects with the induction of phase II xenobiotic metabolism enzymes." (*Mol Pharmacol.* 2007 Jan;71(1):220-9. Epub 2006 Oct 6. University of Washington)
- "In conclusion, the results show, for the first time, that chemopreventive agents such as sulforaphane regulate different set of genes involving apoptosis, cell growth/maintenance and inflammation in the small intestinal polyps of ApcMin/+ mice, which could contribute to the overall chemopreventive pharmacological effects." (*Biopharm Drug Dispos.* 2006 Dec;27(9):407-20 Rutgers Univ.)