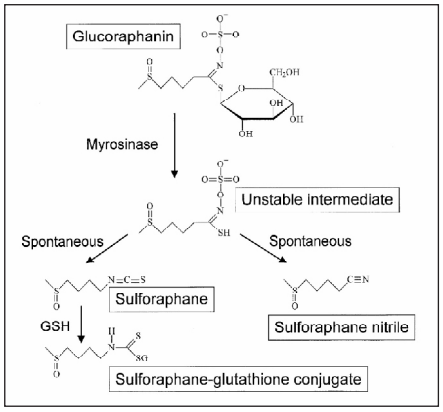
OncoSGS™

designs for health®
Science first.

Sulforaphane Glucosinolate 10%

By Andy Casagranda, CN

Epidemiologists predict that in the U.S. in 2008 there will be 1,437,180 new cancer cases and 565,650 cancer deaths. Many Americans are turning to nutrition as the key to prevention. Fruits and vegetables are known to be the most protective foods in our diet. Scientists continue to discover new phytochemicals in foods and how they work to protect us. Meanwhile, we are continually bombarded by toxic chemicals that are likely playing a role in cancer development. Broccoli could possibly be considered one of the top foods for immune protection.



Glucosinolate, also known as glucoraphanin, is a sulfur-rich compound found in broccoli. Glucosinolate gets hydrolyzed by an enzyme called myrosinase and quickly converts into sulforaphane. Sulforaphane was isolated and identified in 1992. The myrosinase enzyme is compartmentalized in certain parts of the plant. Chopping and chewing of raw cruciferous vegetables, as well as cooking, brings this enzyme in contact with glucoraphanin. Although cooking can inactivate myrosinase, glucosinolates can still be converted to sulforaphane in the gut by bacterial enzymes making both raw and cooked broccoli beneficial.

How does the body deal with toxic chemicals?

Unfortunately, we are exposed to chemicals daily, many of which are carcinogenic. One of the body's first lines of defense against cancer is the detoxification system which is designed to process and rid these chemicals mainly through the liver. The liver acts similar to a dishwasher that first cleans the dishes and then rinses them with hot water. The liver also puts chemicals through two steps of detoxification called Phase I and Phase II.

The goal of detoxification is to convert all toxins into water-soluble form so they can enter the bloodstream and go to the liver for further processing and ultimately be eliminated through the urine or intestines ***in a safer form than when they entered the body***. Phase I cytochrome P450 enzyme activity provides this initial conversion of toxins to more water soluble form through various reactions, including hydroxylation, oxidation, reduction, and others. Phase II is a complicated process that involves a joining of the toxic intermediate produced through the phase I system to another substance which can shuttle it out of the body. This joining process is known as "conjugation". It involves various enzymes including glutathione S-transferase, and major pathways including glutathione conjugation, glucuronidation, glycination and sulfation.

Where does OncoSGS™ come in?

Broccoli seed is especially high in sulforaphane glucosinolate and contains much higher levels than broccoli sprouts. The patented broccoli seed found in OncoSGS is standardized to 10% sulforaphane glucosinolate. The sulforaphane is able to upregulate phase II enzymes to allow for full and proper detoxification of unsafe chemicals. Over aggressive phase I activation of chemicals in the presence of a slow or sluggish phase II system can result in increased toxic burden from highly reactive free radicals, possible DNA damage, and potentially greater cancer risk. Some scientists are working on dietary means to enhance the phase II enzymes—making the body better able to deal with any carcinogen it encounters. Others have focused on inhibiting phase I enzymes, which would keep the initial production of active carcinogens low enough that even those with less effective phase II enzymes can benefit. However, overt suppression of phase I systems is undesirable as it inhibits this two phase system.

What makes OncoSGS™ unique?

OncoSGS™ contains a specially cultivated, patented form of broccoli seed known as BroccoRaphanin™. This proprietary and patented variety of broccoli, Brassica Oleracea italica, is naturally rich in glucoraphanin, a glucosinolate that is the direct precursor to sulforaphane. OncoSGS™ is grown and processed in North America and the intermediate material is shipped to Germany where they extract 99% of the oil from the seed meal using a very clean and non-toxic process called super critical fluid extraction. Only food grade, GRAS (Generally Recognized as Safe), liquid carbon dioxide is used as the

solvent. The process and final product are considered "all natural" and absolutely no solvent residue remains in the finished product. BroccoRaphanin is 15-20 times more potent than broccoli sprouts. One would have to consume approximately 1 lb. of broccoli to equal 1 capsule of OncoSGS. OncoSGS contains the latest, more potent 10% concentration of sulforaphane glucosinolate material. This is a second generation material which has double the potency over previous materials offered in the market. The shelf life on this new material has also been vastly extended due to a special extrusion process of the broccoli seed meal which deactivates the myrosinase enzyme. This will ensure the product does not prematurely convert to sulforaphane in the capsule which, will lead to instability and degradation of the material and will greatly decrease the shelf life as well as the effectiveness of the product.

Supplement Facts

Serving Size 1 capsule
Servings Per Container 30

Amount Per Serving		% Daily Value
BroccoRaphanin® (seed) (*Brassica oleracea italica*) [standardized to contain 10% sulforaphane glucosinolate]	500 mg	*

*Daily Value not established.

Other Ingredients: Microcrystalline cellulose, rice flour, magnesium stearate.

More clinical applications for sulforaphane glucosinolate

- Sulforaphane's ability to induce phase II enzymes may also explain its potential to provide benefit in some arthritic conditions. These enzymes seem to have an inhibitory effect on the inflammatory COX-2 enzymes.
- A recent study (American Journal of Respiratory and Critical Care Medicine, Sept 15, 2008) demonstrated sulforaphane to be beneficial in patients with chronic obstructive pulmonary disease (COPD). In COPD, there is critical loss of antioxidant systems, which protect against oxidative stress and inflammation. Sulforaphane demonstrated the ability to effectively restore the antioxidant gene activity in COPD subjects.
- Research published in the Proceedings of the National Academy of Sciences has revealed that sulforaphane, due to its long lasting antioxidant effects, may offer significant eye protection and promote eye health. Researchers discovered that human retinal cells (the retina is the light-sensitive membrane lining the inner eyeball that focuses light rays) treated with sulforaphane continued to be protected from oxidizing free radicals for several days after the compound was removed.
- Sulforaphane glucosinolate has been shown to protect skin against UV damage.
- Sulforaphane glucosinolate can restore age-related decrease of Th1 immunity.
- Sulforaphane glucosinolate has been shown to be more effective than antibiotics against many strains of H. pylori and helps to prevent H. pylori-induced DNA damage.

More OncoSGS™ facts:

- Per 1 gram of material (2 caps OncoSGS) there is only 1.5 mcg of vitamin K (equivalent of 1 potato), which should make this product acceptable for people taking blood thinners like Coumadin.
- Unlike consuming lots of cruciferous veggies, because of the special processing OncoSGS goes through, it does not contain goitrogens and will not block the uptake of iodine by the thyroid.

How to take OncoSGS™

One 500 mg vegetarian capsule of OncoSGS™ provides a potent dose of 50 mg of sulforaphane glucosinolate. This is an effective daily dose for preventative strategies. In a recent pre-publication double-blind crossover study at the University of Illinois School Of Medicine, in conjunction with the College of Food Science & Human Nutrition, just one 500 mg capsule per day was shown to effectively upregulate several of the glutathione S-transferase phase II enzymes. For more aggressive therapeutic applications, 2-4 capsules per day can be administered. OncoSGS may work synergistically with Amino-D-Tox, Detox Antiox, DIM-Avail and C3 Curcumin.

OncoSGS™ - Protective for males and females

Sulforaphane supports the safe transformation and elimination of estrogen metabolites because it can stimulate both enzymes glutathione S-transferase and quinine reductase which convert estrogen quinones into safer metabolites. Studies have shown that estrogen quinones may interfere with purines, thus potentially causing DNA damage, which may be a cancer initiating event. DIM•Avail and OncoSGS can work as a team in guiding the estrogen metabolites in a two step process: DIM•Avail guides phase I and OncoSGS guides phase II metabolism of E1 (estrone) and E2(estradiol). Also, research findings suggest that sulforaphane from broccoli results in positive signaling pathway changes associated with inflammation and carcinogenesis in the prostate.

References

1. Shapiro, T. A., J. W. Fahey, K. L. Wade, K. K. Stephenson, and P. Talalay. 2001. Chemoprotective glucosinolates and isothiocyanates of broccoli sprouts: metabolism and excretion in humans. Cancer Epidemiol. Biomark. Prev. 10:501-508.
2. Talalay, P., Fahey, J.W., Healy, Z.R., Wehage, S.L., Benedict, A.L., Min, C. and Dinkova-Kostova, A.T. Sulforaphane Mobilizes Cellular Defenses that Protect Skin against Damage by UV Radiation. Proc. Natl. Acad. Sci. USA 104, 17500-17505 (2007).
3. Munday, R., Mhawech-Fauceglia, P., Munday, C.M., Paonessa, J.D., Tang, L., Munday, J.S., Lister, C., Wilson, P., Fahey, J.W., Davis, W. and Zhang, Y. Inhibition of urinary bladder carcinogenesis by broccoli sprouts. Cancer Res. 68(5), 1593-600 (2008).
4. Kim, H.-J., Barajas, B., Wang, M. and Nel, A.E. Nrf2 activation by sulforaphane restores the age-related decrease of TH1 immunity: Role of dendritic cells. The Journal of Allergy and Clinical Immunology DOI: 10.1016/j.jaci.2008.01.016, published on line 6 March 2008.
5. Zhang Y, Talalay P, Cho CG, Posner G. A major inducer of anticarcinogenic protective enzymes from broccoli: isolation and elucidation of structure. Proc. Natl. Acad. Sci. USA, 1992; Mar 89:2399-2403.
6. Jackson SJ, Singletary KW. Sulforaphane inhibits human MCF-7 mammary cancer cell mitotic progression and tubulin polymerization. J Nutr. 2004 Sep;134(9):2229-36.[PMID: 15333709].
7. Chiao JW, Wu H, Ramaswamy G, Conaway CC, Chung FL, Wang L, Lui D. Ingestion of an isothiocyanate metabolite from cruciferous vegetables inhibits growth of human prostate cancer cell xenographs by apoptosis and cell cycle arrest. Carcinogenesis 2004; 25(8):1403-1408 [PMID: 15016658].
8. Fahey JW, Haristoy X, Dolan PM, Kensler TW, Scholtus I, Stephenson KK, Talalay P, Lozniewski A. Sulforaphane inhibits extracellular, intracellular, and antibiotic-resistant strains of Helicobacter pylori and prevents benzo[a]pyrene-induced stomach tumors. Proc Natl Acad Sci USA. 2002 May 28;99(11):7610- [PMID: 12032331].