

# Concentrated Broccoli Seed Extract



## Clinical Applications

- Provides Concentrated Glucoraphanin from Broccoli Seed Extract
- Supports Healthy Cell-Life Cycles\*
- Supports Phase II Detoxification Enzymes\*
- Supports Extended Antioxidant Activity\*
- Supports the Body's Normal Response to Inflammation\*

*SGS™ broccoli seed extract is obtained using a patented process to extract glucoraphanin (also known as sulforaphane glucosinolate or “sgs”) from its most concentrated cruciferous source—broccoli seeds. Glucoraphanin is enzymatically converted to the extensively researched isothiocyanate known as sulforaphane (SFN). Research suggests that SFN supports long-lasting antioxidant activity and the production of detoxification enzymes. It also extends support to the immune, nervous, and cardiovascular systems, addressing the maintenance of good health throughout adult life. Concentrated Broccoli Seed Extract provides 30 mg of glucoraphanin per capsule and Concentrated Broccoli Seed Extract ES provides 100 mg of glucoraphanin per capsule.\**

All 3rd Opinion Inc. Formulas Meet or Exceed cGMP Quality Standards

## Discussion

Glucoraphanin (also known as sulforaphane glucosinolate or “sgs”) is a naturally occurring phytochemical found in cruciferous vegetables and in Concentrated Broccoli Seed Extract formulas. Glucoraphanin, which is heat stable and water soluble, is metabolized in the body to the biologically active isothiocyanate sulforaphane (SFN). Scientists at Johns Hopkins University School of Medicine isolated sulforaphane in 1992 and identified glucoraphanin as its precursor. Since their discovery, over 500 scientific studies have been conducted on SFN and glucoraphanin, documenting their positive effects on antioxidant activity, detoxification, cellular metabolism, and cell-life regulation.<sup>[1-3]</sup> Glucoraphanin and SFN appear to be the “missing link” that correlates a diet rich in cruciferous vegetables (from the Brassicaceae family) with good health. Glucoraphanin from food is enzymatically converted to SFN via the action of the myrosinase enzyme during chewing and food preparation (cutting/slicing). Gastrointestinal microorganisms are able to produce SFN from glucoraphanin as well. Microorganism conversion is an important contribution to SFN production as the myrosinase enzyme is easily inactivated by heat.<sup>\*[4]</sup>

Early research identified broccoli sprouts as a concentrated source of glucoraphanin.<sup>[5]</sup> It is present in much higher concentrations in broccoli seeds and three-day-old broccoli sprouts than in the mature vegetable.<sup>[6,7]</sup> One capsule of Concentrated Broccoli Seed Extract provides 30 g of glucoraphanin, which equates to approximately 0.33 oz of broccoli sprouts or 8 oz of broccoli. One capsule of Concentrated Broccoli Seed Extract ES equates to 1.3 oz of broccoli sprouts or 27 oz of broccoli.<sup>[5]</sup>

**Antioxidant and Detoxification Support** Sulforaphane, upon conversion from glucoraphanin, is found to be an effective long-acting indirect antioxidant and significant inducer of phase II detoxification enzymes.<sup>[3,4]</sup> Research suggests that SFN strongly induces expression of key enzymes (via the KEAP1/Nrf2/ARE pathway), which in turn supports antioxidant activity, redox cycling, and phase II detoxification. The antioxidant enzymes generated are believed to participate in the recycling and maintenance of vitamins A, C, and E as well.<sup>[4]</sup> After studying the effects of various doses of glucoraphanin administered to study subjects, researchers suggest that there may be a dose-dependent association between glucoraphanin and antioxidant enzyme induction. Accordingly, a metabolically effective dose may vary from tissue to tissue (e.g., upper airway, gastric mucosa, mammary, etc.).<sup>[4,8]</sup>

Activation of transcription factor Nrf2 induces increased output of specialized enzymes, an output that can extend antioxidant activity 72 hours or more. This is a significantly longer activity phase than direct antioxidants, such as vitamin C, vitamin E, and beta-carotene, are able to promote.<sup>[2,6,9-11]</sup> Adequate antioxidant protection is crucial to maintaining the health and function of cells, tissues, and organs. Because they assist in maintaining health throughout adult life, phytonutrients, such as glucoraphanin and SFN, are considered “lifespan essentials.”<sup>[12]</sup>

**Support for Cellular Health and Cell-Life Cycles** Glucoraphanin and SFN are believed to play an important role in maintaining healthy gastrointestinal flora; healthy cellular life cycles; immune, eye, and cardiovascular health; and a normal response to inflammation. Sulforaphane’s induction of phase II enzymes, coupled with an inhibitory effect on certain phase I enzymes, is considered to have a protective effect on cells. Research suggests that SFN plays a multidimensional role in maintaining normal cellular life cycles, inhibiting tubulin polymerization, activating checkpoint 2 kinase, and inhibiting histone deacetylase activity.<sup>[2,13,14]</sup> These actions assist in gene regulation, normal cell growth, and cytokine balance.\*

Research suggests that sulforaphane’s effect on Nrf2 pathways, macrophage activation, and NF-kappa B may support a normal, healthy response to inflammation and promote cardiovascular and eye health.<sup>[2,15-18]</sup> Sulforaphane is also studied for its role in maintaining immune health and a healthy gastrointestinal microflora.<sup>\*[19,20]</sup>

**\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**





# Concentrated Broccoli Seed Extract

## Supplement Facts

Serving Size: 1 Capsule  
Servings Per Container: 120

	Amount Per Serving	%Daily Value
Glucoraphanin (from broccoli extract) ( <i>Brassica oleracea italica</i> )(seed)(SGS™)	30 mg	**

\*\* Daily Value not established.

**Other Ingredients:** Microcrystalline cellulose, HPMC (capsule), stearic acid, magnesium stearate, and silica.



Produced under US patents 5,725,895; 5,968,505; 5,968,567; 6,177,122; and 6,242,018 licensed from Brassica Protection Products LLC; SGS is a trademark of Brassica Protection Products.

## Supplement Facts

Serving Size: 1 Capsule  
Servings Per Container: 60

	Amount Per Serving	%Daily Value
Glucoraphanin (from broccoli extract)( <i>Brassica oleracea italica</i> )(seed)(SGS™)	100 mg	**

\*\* Daily Value not established.

**Other Ingredients:** HPMC (capsule), stearic acid, magnesium stearate, and silica.



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## Directions

Take one capsule daily, or as directed by your healthcare practitioner.

Children and pregnant or lactating women should consult their healthcare practitioner prior to use. Do not use if tamper seal is damaged.

## Does Not Contain

Wheat, gluten, yeast, soy, animal or dairy products, fish, shellfish, peanuts, tree nuts, egg, artificial colors, artificial sweeteners, or preservatives.

## Directions

Take one capsule twice daily, or as directed by your healthcare practitioner.

Children and pregnant or lactating women should consult their healthcare practitioner prior to use. Do not use if tamper seal is damaged.

## Does Not Contain

Wheat, gluten, yeast, soy, animal or dairy products, fish, shellfish, peanuts, tree nuts, egg, ingredients derived from genetically modified organisms (GMOs), artificial colors, artificial sweeteners, or preservatives.

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