Nrf2 Activator™

Antioxidant and Detoxification Support Formula*

Available in 30 capsules and 60 capsules

Clinical Applications

- Antioxidant Support*
- Supports the Body's Natural Detoxification Pathways*

Nrf2 Activator™ *is an exclusive formula designed to activate the Nrf2 genetic pathway. This pathway regulates the production of important molecules that impart antioxidant activity, such as glutathione and superoxide dismutase (SOD). It also regulates the production of detoxification enzymes, including glutathione S-transferase, and downregulates signaling factors such as NF-κB.**

Discussion

Nrf2 (NF-E2-related factor 2), a transcription factor in humans that is encoded by the NFE2L2 gene, regulates the expression of a set of antioxidant and detoxifying genes. In an unstressed state, Nrf2 is anchored in the cytoplasm by its specific inhibitor Keap1 (kelch-like ECH-associated protein 1). Keap1 functions as a sensor for oxidants and electrophilic xenobiotics. In the presence of any of these substances, Keap1 gives up its inhibition of Nrf2. This action stabilizes Nrf2, allowing it to accumulate in the nucleus and bind to the antioxidant response element (ARE) located in the enhancers of its target genes. Under this circumstance, Nrf2 then upregulates a variety of antioxidant enzymes and detoxifying proteins.[1-3]

A variety of natural substances have been shown to influence the Nrf2 pathway:

Glucoraphanin, a naturally occurring isothiocyanate derived from broccoli, is hydrolyzed into sulforaphane (SFN) upon consumption. SFN induces phase 2 cytoprotective enzymes, supporting the body's cellular response systems. SFN may modify critical cysteine residues of Keap1, leading to Nrf2 stabilization and activation of the ARE, thereby inducing phase 2 enzymes.[3] A review of various Nrf2 activators suggests that broccoli-derived SFN has exhibited more capacity than many other phytochemicals to activate Nrf2 to induce the expression of cytoprotective genes that play a key role in cellular defense mechanisms, including redox status and detoxification. This activity can be attributed to its lipophilic nature and low molecular weight, which make it highly bioavailable.*[4]

Pterostilbene (PTS) is a naturally occurring phenolic compound/analog of resveratrol that has demonstrated cytotoxic, cytokine-inhibiting, and antioxidant properties.[5] It has been suggested that PTS can increase the protein and mRNA expression of Nrf2. There is evidence that Nrf2-mediated attenuation of oxidative stress and cytokine induction could be partially responsible for the potential effect of PTS on cell-life regulation. In rat and animal studies, resveratrol/pterostilbene have been shown to upregulate a significant number of genes involved in mitochondrial function as well as to modulate cholinergic neurotransmission and activate the Nrf2 pathway to promote transcription of antioxidant genes.[2,5] Although research has provided insights into the mechanism of action of PTS, additional research is warranted to elucidate its roles in the human body.*[6]

Curcumin's array of biological activities stems from its cytokine-balancing activity, antioxidant properties, and induction of phase 2 detoxifying enzymes such as heme oxygenase-1 (HO-1).[7] Because of curcumin's rapid plasma clearance and poor gut absorption, its bioavailability is relatively poor.[8] However, in a pilot crossover study, Antony et al compared the bioavailability of three forms of curcumin: BCM-95®, normal curcumin, and a non-controlled-release curcumin-lecithin-piperine formula. The data demonstrated that the absorption of curcumin from BCM-95 was fast, peaked at 4.5 hours with a gradual decline, and was still detectable in the blood at eight hours. The other formulas showed slower curcumin absorption with an earlier peak and rapid disappearance from the blood after 4.5 hours. The relative bioavailability of BCM-95 was approximately 6.93-fold higher than normal curcumin and 6.3-fold higher than the non-controlled-release curcumin-lecithin-piperine formula. According to the researchers, the results of this study indicate that the BCM-95 curcumin was "absorbed early and retained longer" compared to other forms. Nrf2 Activator features patented BCM-95.*[9]

Purification of curcumin yields the curcuminoids demethoxycurcumin and bisdemethoxycurcumin. The ability of these curcuminoids to induce the expression of HO-1 and to translocate Nrf2 to the nucleus of pancreatic beta cells suggests that they may play a role in modulating the body's natural cellular defense pathways.[7,8,10] Overall, evidence indicates that curcumin exhibits its beneficial effect against oxidative stress through various cellular signaling pathways, including hepatic Nrf2/ARE/Keap1 signaling.*[1,11]

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Green Tea's major polyphenol, (-)-epigallocatechin-3-gallate (EGCG), has been shown to modulate several cellular signaling pathways for regulating cellular proliferation and apoptosis, thereby exerting protective actions on a variety of cells.[12] EGCG modulates the redox-sensitive transcription factor Nrf2, which plays a key role in activating detoxifying enzyme HO-1 as well as other phase 2 enzymes.*[13,14]

XYMOGEN's Nrf2 Activator formula is a promising approach to supporting antioxidant activity by transcriptionally promoting the activity of the Nrf2/ARE pathway.*

Nrf2 Activator™ Supplement Facts

Serving Size: 2 Capsules

	Amount Per Serving	%DV
BCM-95® Turmeric Extract (*Curcuma longa*)(rhizome) (95% total curcuminoids complex, including curcumin, curcuminoids, and volatile oils)(86% curcuminoids)(65% curcumin)	400 mg	**
Green Tea Aqueous Extract (*Camellia sinensis*)(leaf)(80% polyphenols, 60% catechins, 30% EGCG, 6% caffeine)	400 mg	**
pTeroPure® *trans*-Pterostilbene	100 mg	**
TrueBroc® Glucoraphanin (from broccoli extract)(*Brassica oleracea italica*)(seed)	60 mg	**

** Daily Value (DV) not established.

Other Ingredients: Capsule (hypromellose and water), stearic acid, magnesium stearate, and silica.

DIRECTIONS: Take one to two capsules daily, or as directed by your healthcare practitioner.

Consult your healthcare practitioner prior to use. Individuals taking medication, especially blood thinners or cancer treatment, should discuss potential interactions with their healthcare practitioner. Do not use if tamper seal is damaged.

STORAGE: Keep closed in a cool, dry place out of reach of children.

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 artificial preservatives.

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VEGETARIAN CAPS

BCM-95® BCM-95® is an exclusivity licensed registered trademark to Arjuna Natural Pvt Ltd. Protected under US patents 7,883,728; 7,736,679; and 7,879,373.

pTeroPure® is a registered trademark of ChromaDex, Inc.

References

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Additional references available upon request

All XYMOGEN® Formulas Meet or Exceed cGMP Quality Standards.

***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.**

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