

# Avmacol Immune®

Avmacol Immune® is a patented, sulforaphane-producing supplement that works in combination with Maitake mushroom extract (*Grifola frondosa*) to support your body's natural detoxification process better than sulforaphane alone<sup>1</sup>.

To learn more, please visit [AVMACOL.COM](http://AVMACOL.COM)  
or call our Customer Service Department at  
1-855-AVMACOL (1-855-286-2265).

<sup>1</sup>In a laboratory study, treatment of RAW 264.7 cells with the combination of Maitake mushroom extract and sulforaphane resulted in greater induction of the expression of Phase 2 enzyme NQO1 than either individual component alone.

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\*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.

13.1047.00

# Avmacol®

## Sulforaphane Production System®



Unleash the Power of Broccoli®

## Avmacol® is a proactive approach to support your health by providing consistent levels of the necessary ingredients for sulforaphane production, glucoraphanin and active myrosinase enzyme.

Every day, we and our families are exposed to great numbers of potentially harmful toxins and chemical compounds. They can occur naturally or come from man-made sources ending up in the air we breathe, water we drink, and foods we eat. We are even exposed to harmful chemicals in commonly used household and personal care products. These substances are a potential threat to overall health and wellness as they can harm cellular DNA, proteins, and lipids. Thankfully, your body has a natural detoxification system to help get rid of harmful substances to which you are exposed. This internal detoxification system has **2 phases:**

- 1** *First, when harmful toxins enter your body, or when internally produced substances such as hormones have served their purpose, Phase 1 detoxifying enzymes begin to process them into metabolites. If not processed further, these metabolites can harm normal cell function.*
- 2** *Next, Phase 2 detoxifying enzymes process the potentially harmful metabolites into water-soluble compounds that can be more easily excreted from your body.*

More than 3 decades ago, research scientists began to closely investigate certain molecular substances called phytochemicals, (a phytochemical is a biologically active compound of plant or vegetable origin) that help increase the production of these all-important Phase 2 detoxifying enzymes. One of the most potent of these phytochemicals is the molecule sulforaphane (sul-for'-a-fane). Sulforaphane is formed when a compound called glucoraphanin (glu-ko-ra-fan'-in) is transformed by an enzyme called myrosinase (mir-os'-in-ase). Both of these substances are found in cruciferous plants such as broccoli.

The conversion of glucoraphanin to sulforaphane can be expressed in this simple equation:



Even though both glucoraphanin and myrosinase enzyme can be found in cruciferous vegetables, there may not be enough of either compound to allow for adequate sulforaphane production. This can be due to seed quality, soil composition, and many other factors. So while both glucoraphanin and myrosinase enzyme may be found in the vegetables you eat, the ones you buy from the market may not be reliable sources of either compound. Additionally, myrosinase enzyme can be destroyed during the cooking process.

Active myrosinase enzyme is essential for the conversion of glucoraphanin to sulforaphane. Without it, one may not be able to reap sulforaphane's many health-promoting benefits, which is why you'll always find active myrosinase enzyme in the Avmacol® brand family.



## Avmacol's Sulforaphane Production System® and Supporting Research

Avmacol's exclusive Sulforaphane Production System is guaranteed to deliver glucoraphanin and active myrosinase enzyme which helps promote sulforaphane production in your body. It was developed by the dedicated scientists at Nutramax Laboratories, in conjunction with a leading sulforaphane researcher with over a decade of experience working with this amazing phytochemical in the laboratory and in clinical studies.

**Avmacol® is supported with human research. Our exclusive Sulforaphane Production System is validated in humans by precise analytics which measure the metabolites of sulforaphane collected in the urine after consumption. This human data has shown that Avmacol creates a range of sulforaphane production, with an average of 44 micromoles of sulforaphane per recommended serving.<sup>1</sup> It is important to recognize that individual results may vary due to influences of diet, microflora, metabolism, and other factors. Because of the Sulforaphane Production System exclusive to Avmacol, numerous researchers have chosen Avmacol for clinical studies worldwide. (View these studies at [www.ClinicalTrials.gov](http://www.ClinicalTrials.gov)).**

<sup>1</sup>Human data reporting an average of 44 micromoles of sulforaphane per recommended serving applies only to Avmacol® Sulforaphane Production System Coated and Uncoated Tablets.

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## How Avmacol® Works

Sulforaphane is a small molecule and has been shown to pass through the blood-brain barrier to work through **these 3 protective pathways** for neural health support:\*

**I NRF2 Pathway:** Sulforaphane induces a regulator protein, NRF2, to enter the nucleus and bind to DNA. This helps increase the production of important Phase 2 detoxifying enzymes, promoting your body's natural detoxification process, thereby supporting the elimination of potentially harmful metabolites.\* It is through this pathway, and the increased production of a specific enzyme called gamma-glutamyl cysteine synthase, that sulforaphane also helps support the production of glutathione, the most important antioxidant and detoxification substance produced in our body. The induction of additional enzymes by sulforaphane through the NRF2 pathway also helps support mitochondrial function by reducing mitochondrial oxidative stress. Mitochondria are the essential structures within our cells that are responsible for energy production.

**II Heat Shock Pathway:** Sulforaphane induces the production of a series of heat shock proteins including HSP32 (a.k.a. Heme Oxygenase-1), which are known to help protect proteins from cellular stress. Heat shock proteins have a wide range of functions including facilitating the proper folding of cellular proteins and preventing protein aggregation (clumping) to keep them in their biologically active state.

**III NF-kB Pathway:** NF-kB (Nuclear factor-kB) is a key regulator protein whose presence in the nucleus increases the production of cytokines (cytokines are any number of substances that are secreted by certain cells of the immune system and have an effect on other cells) and enzymes leading to cellular stress. Sulforaphane helps inhibit NF-kB from entering the nucleus.

## Avmacol® is:

- ✔ *Vegetarian*
- ✔ *Gluten-Free*
- ✔ *Packaged in BPA-free bottles*
- ✔ *Subject to more than 80 quality checks*



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