

# VPS® *Coriolus versicolor*

Fruit Body Cell Wall Extract  
Min. 35% 1-4, 1-3 Protein-Bound Polysaccharide

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## Coriolus

Over 300 published studies have been conducted on the immuno-modulating\* properties of the 1-4,1-3 proteoglycans extracted from the cell walls of *Coriolus versicolor*, including 24 human studies (14 controlled, randomized, human clinical trials). With over \$350 million in annual sales in Japan, this cell-wall extract has become one of the most widely used supplements in the world for supporting immune health.\*

Decoctions of *Coriolus versicolor* have been used for centuries in Traditional Chinese Medicine, with references in the Chinese Compendium of Materia Medica dating as far back as the 15th century. The Ming dynasty edition states that "*The black and green Yun zhi are beneficial to one's spirit and vital energy, and strengthen one's tendon and bone. If Yun zhi is taken for a long time, it will make one vigorous and live long.*"

### How Supplied

150 Vcaps  
625 mg per Vcap

### Indication

Immune modulation, hepatic support. Used for serious immune support, especially indicated in those situations where the white blood count is suppressed.

### Instructions For Use

Two to three capsules two times daily. For maximum dose, use no less than 3000 mg of extract per day with a minimum of 34-40% polysaccharide content.

### Toxicity, Cautions, Contraindications

Coriolus polysaccharides are safe and nontoxic, having been used daily in clinical studies lasting five to ten years. However, immuno-modulating substances should be used with extreme care or avoided completely in organ-transplant patients utilizing immuno-suppressive agents.

### Clinical Research

The research suggests that the polysaccharide portion of the extract may enhance the cell-mediated immune response.\* Although the mechanism of action is not clearly understood, the 1-4,1-3 proteoglycans act as a biological response modifier and have been found to support and enhance Natural Killer cell function, to stimulate depressed lymphocyte proliferation, and to support the healthy growth of white blood cells.\*[1,2,3](#) Also, the research shows these constituents to be effective in supporting normal cell growth, improving cell-mediated cytotoxicity, and increasing interleukin-2 production and T-cell proliferation.\*[4,5,6](#)

### Selected Clinical Studies

The results of an eight-year clinical trial, published in 1990, recorded substantial benefit from daily use of the Coriolus 1-4,1-3 extract. The group receiving the Coriolus extract experienced a significant improvement in

immune health over the group receiving the placebo, with the leukocyte activity of the Coriolus group showing "remarkable enhancement." It was concluded that "*the beneficial effects were probably due to the activation of leukocyte function\* as one of the many biological-response-modifying activities induced by (Coriolus).*"<sup>7</sup> In a study published in Lancet, Coriolus was found to have a "restorative effect in patients who have been immunosuppressed" and were experiencing depressed white blood counts.<sup>8</sup>

### **Traditional Use And Preparation**

Coriolus is sweet in taste and slightly warm in nature, acting through the spleen and heart meridians. It dispels damp and reduces phlegm.<sup>9</sup> In Traditional Chinese Medicine Coriolus is prepared as a hot-water extraction/decoction.<sup>10</sup> Coriolus is never used in the un-extracted form or prepared as a cold-process tincture.

### **Active Constituents**

Heavy Molecular Weight Polysaccharides (1-4,1-3 proteoglycans)

### **Extraction Information**

Hot-water extracts from both the fruit body and the mycelium are used in current clinical practice and research. The active constituents, the polysaccharides, are found in the cell walls of both, although extracts from the fruit body have shown higher levels of immune activity\* with oral use.<sup>11</sup> VPS® is isolated through a multi-step hot-water extraction process, creating a high concentration of the 1-4,1-3 cell-wall constituents used in the Japanese research. As these compounds are difficult to extract and easily degraded with excessive heat NMR and linkage analysis are used to ensure product quality.

### **Description**

**Latin** ... *Coriolus versicolor*, *Trametes versicolor*

**Chinese** ... Yun zhi (Cloud Mushroom)

**Japanese** ... Kawaratake

**Common Name** ... Turkey Tail

*Coriolus versicolor* belongs to the family Polyporaceae and is found throughout the wooded temperate zones of North America, Asia, and Europe. Found predominantly on hardwoods, the thin, woody, shelf-like fruit bodies form dense overlapping clusters on the sides of stumps and fallen trees. The fruit bodies (mushrooms) have a plush, velvety surface, are colored in varying shades of gray or brown, and have a distinctive pattern of alternating bands of dark and light color. The bottom is cream colored and porous.

### **References**

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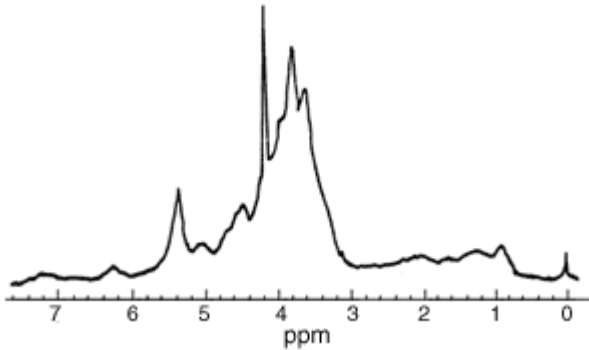
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## What Is It ?

There are many chemically distinct extract products that can be produced from the mushroom *Coriolus versicolor*. VPS® contains the most highly prized and the most difficult to obtain compounds found in *Coriolus versicolor*, those compounds found in the cell walls of the mushroom and the mycelium (the vegetative form). It is the cell wall extracts that were used in Traditional Chinese Medicine, and it is these same compounds that form the basis of the modern clinical research.

According to the patents and independent lab analysis the following information is available:

### NMR Spectrum



### Elemental Analysis

Carbon.....	40.5%
Hydrogen.....	6.2%
Nitrogen.....	5.2%
Oxygen.....	47.5%

### Content Analysis

Soluble carbohydrate.....	42%-43% ( 91-93 % beta-glucan containing glucose polymer)
Protein.....	28%-35% ( amino acids)
Moisture.....	7%-7.6%
Ash.....	6%-7% ( carbon)
Remainder.....	Free Sugars and Amino Acids

### U.S. Patent 4,202,969

## Protein-Bound Polysaccharides (beta glucans)

### The Key

Research with the mushroom *Coriolus versicolor* has found that the protein-bound polysaccharides with the beta-1,4, beta-1,3 , and beta-1,6 linkage are the primary active compounds. (13, 14). The problem is obtaining significant concentrations of these difficult to extract polysaccharides.

In both the mycelium (the vegetative stage), and the mushroom (the fruiting stage), the cell walls are made of chitin. This material, like the cellulose in higher plants, gives the mushroom its structural rigidity. This chitin also contains the polysaccharides, the primary active compounds.

Chitin is indigestible by people, therefore the active compounds will not be in a bio-available form in a non-extracted (raw) mushroom product. These polysaccharides are also insoluble in alcohol. Through mastering a technically difficult, multi-step, hot water extraction process, researchers found a way to concentrate the polysaccharides at a level that made large scale production a practical reality.

Only a multi-step hot water extraction process is capable of concentrating these active compounds to levels that make them useful as a nutritional support in chronic conditions. VPS is the only *Coriolus* product on the North American market manufactured in this manner, and, as compared to other *Coriolus* products, has a significantly higher concentration of the active polysaccharides.

## How Does It Work?

The cell wall extract from *Coriolus versicolor* has been clinically proven to stimulate and enhance the effectiveness of the bodies own natural defenses, a critically important step in maintaining good health.

In one particular study *Coriolus* polysaccharides were given to both healthy volunteers and to patients with gastric cancer, and the polysaccharides stimulated a significant immune response within 24 hours. (15) In another study workers in a chemical plant were given the polysaccharides for a period of eight weeks. Significant enhancement of NK cell activity was noted along with other significant improvements in immune parameters, with the study concluding that *Coriolus* polysaccharides "*potentiate the immunity of non-tumor bearing individuals with depressed immunity.*"(16)

## Enhanced Immune Function

Every herbal extract contains a number of "major" and "minor" chemical components. It is important to note that it is the effect of all of these components working together that creates the desired effect, and that minor components will play a crucial role in determining the effectiveness of the primary active compounds.

In *Coriolus versicolor* the primary active compounds are polysaccharides. These polysaccharides are composed of a unique combination of amino acids and beta-glucans that are not affected by the digestive process and are therefore effective when used orally.

Different physiochemical parameters, such as solubility, primary structure, molecular weight, and **branching** all play an important role in determining the immune activities of polysaccharides.

The polysaccharides found inside the indigestible cell walls of *Coriolus versicolor* are "*three dimensional*", with side chains branching off a backbone structure of linear glucose molecules. It is these secondary structures, the branching side chains, that confer biological function or immune activity allowing a "*key and lock*" interaction between the branching side chains and the receptors on the different immune cells.

Receptors for beta-glucans have been found on a number of different immune cells including natural killer cells and neutrophils, (17,18) monocytes/macrophages, (19) and on T and B lymphocytes (20).

However, *Coriolus* has multiple pathways for stimulating an immune response. *Coriolus* polysaccharides have also been shown to stimulate the antigen-presenting cell function of macrophages and, consequently, to stimulate overall immune function (21). Several studies have also reported the ability of *Coriolus* polysaccharides to enhance in vitro proliferation of T and B lymphocytes (22), and to enhance the cytotoxic activity of NK cells (23).

Recent U.S. research has confirmed these immuno-modulating properties, specifically, these polysaccharides acted as a potent inducer of proliferation, tumor cytotoxicity, and lymphokine production by human lymphocytes in *in vitro* studies(24).

## Clinical Studies

The clinical research conducted with Coriolus polysaccharides is extensive and unique among medicinal mushrooms.



*Coriolus cultivated under laboratory conditions*

As part of the Japanese Health Ministry's approval process the 1-4, 1-3, 1-6 Coriolus polysaccharides went through 24 human clinical trials with 14 controlled, randomized, double blind human clinical studies. Coriolus polysaccharides are the most thoroughly researched and most successful all-natural immune supplement in the world and the only immune product to be proven in independent, published clinical studies.

## Coriolus vs. Placebo

The use of Coriolus polysaccharides to support immune health was studied in a randomized, controlled, clinical trial after curative surgery for colon cancer. The follow up time was ten years. The researchers found that, when compared with the control group (surgery only), the leukocyte activity of the Coriolus group showed "remarkable enhancement".

It was concluded that *"the beneficial effects were probably due to the activation of leukocyte functions as one of the many biological-response-modifying activities induced by (Coriolus polysaccharides)"*(25). This improvement in immune function was found to be statistically significant and beneficial.

## Coriolus Combined With Other Therapies

Controlled clinical studies have also found Coriolus polysaccharides to be effective in supporting immune health in those people receiving treatments where immune suppression is a prominent feature, showing the ability to "inhibit disorders of cellular immunity attributed to" the treatments (26, 27).

A five year study published in Lancet found that those patients receiving Coriolus polysaccharides experienced a significant improvement over the control group (28). Researchers found the Coriolus polysaccharides to have a "restorative effect in patients who have been immuno-suppressed".

Coriolus polysaccharides have also been studied for their immuno-restorative effect in those people receiving radiation treatment after surgery for non-small cell lung cancer. This study found that the *"five-year survival rate of the patients (who received Coriolus polysaccharides) with stages I or II disease, as well as stage III, was 39% and 22% respectively, compared with the non-administered groups' 16% and 5%. These differences are statistically significant."*(29) Stage III patients that received Coriolus polysaccharides along with radiation had a better survival rate than stage I patients receiving radiation alone (22% vs. 16%).