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# Shiitake Mushroom

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SIGN UP

[All](#) <#> [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

## Shiitake Mushroom

[Healthcare Professional](#)[Consumer](#)

- [Scientific Name](#)
- [Common Name](#)
- [Clinical Summary](#)
- [Food Sources](#)
- [Purported Uses](#)
- [Constituents](#)
- [Mechanism of Action](#)
- [Adverse Reactions](#)
- [Herb Lab Interactions](#)
- [Literature Summary and Critique](#)
- [References](#)



### Scientific Name

Lentinula edodes

[Top](#)

### Common Name

Forest mushroom, lentinula, pasania fungus, lentinula, hua gu

[Top](#)

### Clinical Summary

Shiitake mushroom, native to East Asia, is cultivated worldwide for its purported health benefits. The fresh and dried forms of the mushroom are commonly used in East Asian cooking. It is also valued as an anticancer agent.

Lentinan (1,3 beta-D-glucan), a polysaccharide isolated from Shiitake, has been well studied and is thought responsible for Shiitake's beneficial effects. It was shown to have anticancer effects in colon cancer cells [\(1\)](#), which may be due to its ability to suppress cytochrome P450 1A enzymes that are known to metabolize pro-carcinogens to active forms [\(2\)](#).

Lentin, the protein component, has strong antifungal properties, inhibits proliferation of leukemic cells, and suppresses the activity of human immunodeficiency virus-1 reverse transcriptase [\(3\)](#). Studies conducted with Shiitake extracts in vitro and in mice revealed the mushroom's antiproliferative [\(4\)](#), cytotoxic [\(21\)](#), immunostimulatory [\(4\)](#), hepatoprotective [\(5\)](#), antimutagenic [\(6\)](#), and anticaries [\(7\)](#) properties, but a clinical trial failed to show effectiveness in the treatment of prostate cancer [\(8\)](#).

Results from two small studies of HIV-positive patients who were administered intravenous lentinan showed a statistically insignificant increase in CD4 cells and neutrophil activity in some patients; researchers also

reported severe adverse effects in some patients [\(9\)](#).

But improvements in quality of life and survival were seen with an oral formulation of superfine dispersed lentinan in patients with hepatocellular carcinoma [\(15\)](#), gastric [\(16\)](#), colorectal [\(17\)](#), and pancreatic [\(18\)](#) cancers. An orally administered Shiitake mycelial extract decreased the incidence of adverse effects associated with chemotherapy in a small study of patients with advanced gastrointestinal cancer [\(22\)](#).

Large scale studies are needed to establish Shiitake as a useful adjunct to cancer treatment.

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[Top](#)

## Food Sources

Available as fresh or dried whole mushroom.

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[Top](#)

## Purported Uses

- Cancer prevention
- Cancer treatment
- High cholesterol
- Immunostimulation
- Infections

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[Top](#)

## Constituents

- Polysaccharides: Lentinan, 1-3-beta-D-glucan
  - Protein: Lentin
  - Lipids: Linoleic Acid
  - Ergosterol
  - Amino Acids: Lysine, arginine, methionine and phenylalanine
  - Minerals and electrolytes: Potassium, calcium, magnesium, manganese, iron, copper, and zinc
  - Lignins
- [\(3\)](#)

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[Top](#)

## Mechanism of Action

Lentinan possesses immune-regulatory, antimicrobial, anti viral, and cholesterol-lowering effects [\(13\)](#). The water extract of shiitake decreased IL-1 production and apoptosis in human neutrophils. However, it increased apoptosis in U937 monocytic cell line [\(14\)](#). Lentin, the protein component of shiitake, has strong antifungal effects. An in vitro study has shown lentin can inhibit the proliferation of leukemia cells and suppress the activity of human immunodeficiency virus-1 reverse transcriptase [\(3\)](#).

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[Top](#)

## Adverse Reactions

### Case Reports:

Chronic hypersensitivity pneumonitis was observed in a lung cancer patient following exposure to Shiitake spores [\(10\)](#).

Prolonged consumption of Shiitake powder resulted in dermatitis, photosensitivity [\(11\)](#), eosinophilia, and gastrointestinal upset [\(12\)](#).

Intermittent skin eruptions (dermatitis), over a period of 16 years, were linked to consumption of shiitake mushrooms in a 45-year-old male [\(19\)](#).

Food allergy manifested as oesophageal symptoms was reported in a 37-year-old man following consumption of shiitake mushroom [\(20\)](#).

Hypersensitivity pneumonia was reported in a 37-year-old man following inhalation of Shiitake mushroom spores [\(23\)](#).

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[Top](#)

## Herb Lab Interactions

Chronic consumption of Shiitake may increase eosinophil count. [\(12\)](#)

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[Top](#)

## Literature Summary and Critique

Few significant clinical studies have been performed with the shiitake mushroom. However, [lentinan](#), a

polysaccharide component of the mushroom, has been studied extensively.

[Top](#)

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[Top](#)

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