

# MUSHROOM-DERIVED COMPOUND OFFERS PROMISE FOR CHRONIC FATIGUE PATIENTS

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By Sara Lovelady, Contributing Writer

A glucan-based compound derived from Shiitake mushrooms might provide a sorely needed new option for people with chronic fatigue syndrome. Known as Active Hexose Correlated Compound (AHCC), this compound has both immune-enhancing and direct antiviral effects, particularly against Human Herpesvirus 6 (HHV-6), a pathogen that has been linked with CFS in some studies.

CFS is a common, vexing, and poorly understood condition characterized by persistent fatigue not relieved by sleep, and lasting at least six months in adults or three months in children or teens. People with CFS often suffer from muscle and joint pain, as well as muscle weakness, low motivation and mood, and curtailed activity.

The disorder likely has multiple causes, but since the late 1980s, the prevailing scientific view is that viral infections are a key factor (Komaroff AL, et al. *J Rheumatol. Suppl.* 1989;19:23-7). Suspected viruses include the Epstein-Barr virus (EBV) and two strains of the herpes virus (HHV-6 and HHV-7).

## The CFS Viral Hypothesis

There is certainly some convincing evidence that viruses contribute to the development of CFS.

- One study initially found no difference in prevalence of HHV-6 or HHV-7 infection between CFS patients and healthy subjects. However, when the researchers considered people infected with *both* the HHV-6 and HHV-7 virus, they found a significant correlation with CFS (Chapenko S, et al. *J Clin Viro.* 2006;37 Suppl 1:S47-51).
- A review of CFS patients receiving the antiviral drug, valganciclovir, for HHV-6 and/or EBV found over half responded well to the treatment. Of those helped, 59% had improvements in physical symptoms, and a whopping 81% had improved mental function. The longer the treatment, the better the response (Watt T, et al. *J Med Virol.* 2012;84:1967-74).
- A double-blind, clinical trial of 30 CFS patients, who also had elevated HHV-6 and EBV antibodies, showed that compared with placebo, treatment with valganciclovir for six months relieved mental fatigue and improved cognitive function (Montoya JG, et al. *J Med Virol.* 2013;85:2101-9).
- Finally, a study of 15 preteens and adolescents with treatment-resistant depression and CFS found that anti-viral treatment produced positive results in 93% of the subjects (Henderson TA. *Adv Mind Body Med.* 2014;28:4-14).

While there's still much more scientific work needed before we can definitively conclude that CFS has a viral cause, the aggregate clinical evidence is hard to ignore.

There is also evidence that immune system dysfunction may underlie CFS. Two studies published earlier this year have found that patients with CFS have defective natural killer cell and invariant natural killer T cell function (Petty RD, et al. *PLoS One.* 2016 Mar 11;11(3): e0150904. doi:10.1371/journal.pone.0150904. eCollection. 2016; Ramos S, et al. *Asian Pac J Allergy Immunolol.* 2016 Mar 20. 10.12932/AP0733).

It's interesting to note that natural killer cells play a major role in resolving the acute phase of HHV-6 infection (Kumagai T, et al. *J Med Virol.* 2006 Jun;78(6):792-9).

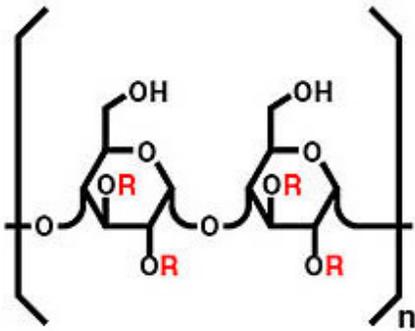
It may be that it is the underlying immune system deficit that renders people more vulnerable to viral infections, with the CFS pattern emerging as a long term downstream consequence.

## Mushroom Compounds & Immune Stimulation

Beyond antiviral drugs, is there a natural alternative to address the underlying viruses that may contribute to CFS?

While research is in the preliminary stages, there's reason to get excited about AHCC. The compound is an extract of shiitake mushroom (*Lentinula edodes*) mycelium, which is very rich in glucans. All medicinal





$\alpha$ -1,4 glucan (R: H or CH<sub>3</sub>CO-)

mushrooms contain glucans, but the alpha-glucans in AHCC appear to have greater immunostimulatory potential than the beta-glucans found in other types of mushrooms.

Due to a patented manufacturing process, the alpha-glucans are also smaller, which makes them easier to absorb into the bloodstream.

AHCC, which was discovered and developed in Japan several decades ago, has been studied extensively and is currently in use in 700 clinics worldwide as a standard preventative regimen to reduce the risk of infection.

Oral ingestion of AHCC stimulates the production and the activity of several important components of the immune system, including various cytokines, natural killer cells, macrophages, T cells, dendritic cells, and B cells. In Japan, and elsewhere, AHCC has been used in the treatment of liver, gastric, colon, prostate, and breast cancer.

## AHCC's Anti-Viral Action

There is good evidence that AHCC is active against a number of viral pathogens:

- Cancer patients undergoing chemotherapy are vulnerable to infection with HHV-6, so researchers studied a group of 29 such patients who took AHCC during their second stint of chemotherapy but not during the first. Levels of the virus in patients' saliva rose significantly during the first course of chemotherapy, but fell significantly during the second course when they were also taking AHCC (Ito T, et al. *Nutr Cancer*. 2014;66 (3): 377-82).

- Animal research suggests AHCC may be effective against the West Nile virus and at least two strains of the flu, including the H5N1 (bird flu) virus (Fujii H, Nishioka H, et al. *Jap J Complement Altern Med*. 2007;4:37-9). One study, in which mice were infected with the flu, showed flu-related death rates of 25% in untreated animals, but only 5% in the animals given AHCC (Ritz BW, et al. *J Nutr*. 2006;136:2868-73). Similarly, animals infected with the West Nile virus were twice as likely to survive when treated with AHCC (Wang S, et al. *J Nutr*. 2009;139:598-602).
- Two randomized, controlled studies of healthy adult humans have shown AHCC increases the effectiveness of the flu vaccine by improving antibody response (Roman BE, et al. *Nutr Res*. 2013;33:12-7. Gardner E, et al. Presented at Experimental Biology meeting. April 2010).
- A double-blind, placebo-controlled trial of 39 patients with the hepatitis C virus found that AHCC helped stabilize the condition in the treatment group, while those in the control group declined (Thaiudum S, Piyaniran W, Chuaputthi A. *The Medical News (Thailand)*. 2010;325:13-6).

## AHCC & CFS

What does all of this have to do with chronic fatigue?

While AHCC has not yet been specifically studied in connection with CFS, the fact that it has significant impact on two of the main factors influencing the development of CFS-- common viral infections, and underlying immune system deficiencies--support the notion that this supplement could be beneficial to people with this condition.

Anecdotally, CFS patients taking the research-supported dose of 3 grams AHCC daily for at least six weeks do report symptom improvements across multiple parameters, especially if the CFS is viral-related.

On the safety side, AHCC is one of the most well-studied natural products on the market. The research shows a consistent pattern of safety with few if any significant side effects.

