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New Study Shows Lion's Mane Can Boost Your Memory

Analysis by Dr. Joseph Mercola ✔ Fact Checked | September 21, 2023

STORY AT-A-GLANCE

- Data show compounds found in lion's mane mushrooms impact nerve cell growth in the lab and improve memory performance in an animal study. The isolated compounds were N-de phenylethyl isohericerin (NDPIH) and its hydrophobic derivative, known as hericene A
- A 2020 pilot study with 41 participants demonstrated that those who received capsules with active ingredients from lion's mane mushrooms over 49 weeks had higher cognitive mental state and activities of daily living scores than those taking the placebo
- Other research has demonstrated that ergothioneine found in many varieties of mushrooms is associated with a lower rate of neurodegenerative disease and that mushrooms rich in beta-glucans play a beneficial role in obesity, high blood pressure and insulin resistance
- Ergothioneine may be a mushroom's stealth ingredient playing a role in mitochondrial function. Although not everyone eats mushrooms, most people are positive for ergothioneine, which one scientist postulates is related to animals eating plants in fungi-rich soil
- This is just one benefit derived from regenerative farming practices that focus on improving soil health. I highly recommend adding mushrooms to your diet and that you choose organically grown mushrooms, since the fungi easily absorb air and soil contaminants

Have you ever seen what looks like white, giant cheerleading pom poms stuck on a tree? What you're looking at is probably a lion's mane mushroom, which may be one of the strangest looking fungi. A 2023 animal study[1] published in the Journal of Neurochemistry demonstrates that an active ingredient found in lion's mane mushrooms can enhance cognitive performance and memory.

These results demonstrate the importance of determinants, such as environmental toxins and nutrition, to cognition. A 2019 study[2] reviewed the results of 20 population-based cohorts that included 48,522 individuals analyzing factors that were associated with cognitive decline. The results demonstrated smoking, physical activity, diabetes, education and stroke are modifiable factors that affect cognition.

According to the Centers for Disease Control and Prevention,[3] data showed that subjective cognitive decline (SCD) is a growing public health issue, with a higher prevalence found in the southern states. The overall prevalence of SCD throughout the U.S. is 11.1% in adults aged 65 years and older as compared to 10.8% in adults aged 45 to 64 years.

Everyone has an occasional forgetful moment, but forgetting important events that you normally would have remembered may be a sign of mild cognitive impairment, which can significantly impact your life and your ability to live independently. Data from the featured study indicate that one of the steps you can take to help protect your brain is to eat mushrooms.

Mushrooms Boosted Memory and Nerve Growth in Animal Study

Lion's mane mushroom has traditionally been used in Asian countries not only for brain health and memory, but to enhance peripheral nerve regeneration, the mechanism of which is targeting nerve growth factor neurotrophic activity.[4] Researchers in the featured study[5] looked at compounds in lion's mane mushroom, particularly hericene A, as it impacts nerve cell growth and improvement in memory performance.

The study first purified a biologically active compound with the ability to promote neurite growth in the lab. The isolated compounds were N-de phenylethyl isohericerin (NDPIH) and its hydrophobic derivative, known as hericene A. The researchers found these two compounds effectively stimulated axonal growth and branching in hippocampal neuron cultures.

Normally, these neuron cultures require serum and brain-derived neurotrophic factor (BDNF) in the growth medium to support growth and survival. However, in this lab study, it appeared that the lion's mane mushroom extract promoted growth in the absence of serum and BDNF. Study author Frédéric A. Meunier, professor at The University of Queensland and leader of the Single Molecule Neuroscience Laboratory, explained:[6]

> *"Further, at the tip of each of these branches, there is normally a tiny structure called a growth cone that is capable of sensing the environment and orientating the growth of its particular branch.*
>
> *In the presence of the lion's mane mushroom compounds, the size of these growth cones was hugely increased with some being even larger than the cell body of the neuron. It would be like having a hand larger than your own body, so even more surprising!*
>
> *These growth cones are search engines capable of finding target neurons and establishing connections between them. This suggested that the compounds could promote the establishment of new connections between neurons in the brain, which is at the core of memory formation. This is why we tested various paradigms of memory to see if the compound had any effect which we found they had."*

Moving from the lab to an animal model, the researchers used male mice that were divided into several groups, including a control group, a positive control group, and several groups that were given different doses of the extract. The positive control group was given a known memory-enhancing drug.

The group that received the highest dose of the mushroom extract demonstrated greater interaction with novel objects, suggesting the mice had improved short-term memory. Those treated with a lower dose also displayed significant positive increments in spontaneous behavior indicating improved spatial memory.[7]

Meunier is excited about the results and understands that further study is needed to identify the molecular mechanism of action. Current clinical trials are underway using lion's mane extract in Alzheimer's disease. He estimates other novel applications should also be explored. For example, they "could serve as the basis for a new generation of new therapeutics for a range of brain diseases to optimize their efficacies."[8]

Lion's Mane Mushrooms Offer More Health Benefits

One 2020 pilot study[9] evaluated the prevention of early Alzheimer's disease with lion's mane mushrooms in a double-blind, placebo-controlled trial. The trial was conducted at Chung Shan Medical University in 41 patients who were diagnosed with mild Alzheimer's Disease.

The participants received either three 350 mg capsules containing 5 mg per gram of the active ingredient tested from lion's mane mushrooms or a placebo. The study began with a three-week screening period during which all participants received no drugs, followed by a 49-week double-blind treatment in which participants were randomized to receive either the intervention or a placebo.

Throughout the 49 weeks, the participants underwent cognitive assessments, biomarker collection, neuroimaging and eye exams. After the baseline assessment, the participants were examined and rated at weeks 13, 25 and 49 to determine the efficacy of the intervention, which was measured by the change from baseline to week 49.[10]

The researchers found that those taking the intervention capsules had higher scores on the Cognitive Abilities Screening Instrument, Mini Mental State Examination and Instrumental Activities of Daily Living when compared to those in the placebo group.

The researchers suggest that these capsules were safe, well-tolerated and may offer important neurocognitive benefits.[11]

Lion's mane mushrooms have a long history in Traditional Chinese Medicine (TCM) and more recently researchers have discovered that they can help reduce high blood pressure, control blood sugar, promote wound healing[12] and have antidepressant-like properties[13] that may offer an alternative for the treatment of depression.

Mushroom Nutrients and Antioxidants Promote Longevity

In addition to brain health and other benefits, mushroom varieties also are high in antioxidants that other fungi do not have, and which may promote longevity. Among those are ergothioneine and glutathione, also called the master antioxidant.

Robert Beelman is Professor Emeritus of food science and director of the Penn State Center for Plant and Mushroom Products for Health. He commented in a press release following the publication of a study in Food Chemistry in which researchers discovered that mushrooms have antiaging potential:[14]

> *"What we found is that, without a doubt, mushrooms are the highest dietary source of these two antioxidants [ergothioneine and glutathione] taken together, and that some types are really packed with both of them.*
>
> *There's a theory — the free radical theory of aging — that's been around for a long time that says when we oxidize our food to produce energy there's a number of free radicals that are produced that are side products of that action and many of these are quite toxic.*
>
> *The body has mechanisms to control most of them, including ergothioneine and glutathione, but eventually enough accrue to cause damage, which has been associated with many of the diseases of aging, like cancer, coronary heart disease and Alzheimer's."*

Beelman focused his research on the relationship between ergothioneine and glutathione with neurodegenerative conditions. He points out that in countries like France and Italy where people consume more ergothioneine in their diet, there's a lower incidence of neurodegenerative diseases.

By comparison, in countries where there's a low amount in the diet, there's a higher probability of conditions like Parkinson's and Alzheimer's disease. He notes that this is just a correlation, and a causation has not been established. However, when low rates of neurodegenerative diseases are associated with eating approximately five button mushrooms each day, this intervention is something that should be investigated.[15]

One chemical analysis[16] also revealed that mushrooms are rich in beta-glucans, which are naturally occurring polysaccharides known to play a beneficial role in high blood pressure, obesity and insulin resistance. Several past research studies have demonstrated that **beta-glucans** play a role in the prevention of viral infections, including a 2015 animal study[17] showing a significantly reduced effect of influenza infection in total mortality.

Eating Mushrooms Each Day May Lower Your Cancer Risk

To lower your risk of cancer, you may only need to eat mushrooms each day. Researchers from Pennsylvania State University[18] looked at the association between the risk of any type of cancer and mushroom intake between 1966 to 2020. Data from more than 19,500 patients with cancer showed those who ate the most mushrooms had the lowest risk.

The research showed that oyster, shiitake, maitake and king oyster mushrooms have higher levels of ergothioneine than cremini, Portobello and white button mushrooms. Yet, they also found that people who ate any variety daily had a lower risk of cancer.

“Mushrooms are the highest dietary source of ergothioneine, which is a unique and potent antioxidant and cellular protector,” said Djibril M. Ba, a graduate student in

epidemiology at Penn State College of Medicine. “Replenishing antioxidants in the body may help protect against oxidative stress and lower the risk of cancer.”

The researchers found a specific link between eating a high number of mushrooms and a low risk of breast cancer. They reported in a press release that the participants who ate 18 grams of mushrooms, or about one-eighth to one-fourth cup, each day had a 45% reduced risk of cancer.[19]

Do Fungi Connect Healthy Soil and Healthy People?

Ergothioneine may be mushroom’s stealth ingredient, as it "is concentrated in mitochondria, suggesting a specific role in protecting mitochondrial components, such as DNA, from oxidative damage."[20]

Mushrooms are the leading dietary source of ergothioneine, yet not everyone eats mushrooms. So, Beelman began asking the question, if not everyone eats mushrooms, how is everyone getting ergothioneine in their body?[21]

Ergothioneine is not synthesized by all bacteria and fungi. Scientists have found it in nearly all human tissue and body fluids and recognize it as a powerful antioxidant. Beelman and his colleagues hypothesized that ergothioneine from mushrooms was being absorbed into crops through the underground association with fungal mycelium.

Ergothioneine can be found in the fruiting body of the fungi, the mushroom, and along the mycelium. When animals eat plants rich in ergothioneine, it gets into the meat. Beelman hypothesized that this may be how the amino acid is found throughout the human population.

This benefit is just one reason to support regenerative farming practices that focus on improving soil health, sequestering carbon using minimal or no till practices and planting cover crops. These strategies improve the land yield and the nutrition of the crops grown.

I highly recommend adding mushrooms to your diet as they're an excellent addition to any salad and go great with all kinds of grass fed meat and wild-caught fish. However, it is crucial you choose organically grown mushrooms since fungi easily absorb air and soil contaminants.

Sources and References

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