

Asian mushroom extract shows promise as treatment for obesity and its ills

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The lingzhi mushroom or reishi mushroom. *Ganoderma lucidum*. Credit: Eric Steinert/Wikipedia

Maybe Alice in Wonderland was on to something, nibbling on a mushroom to make herself shrink. New research has shown that a liquid extract made from a mushroom used in traditional Asian medicine for more than 2,000 years protects against weight gain and reverses obesity-related inflammation and metabolic dysfunction in overfed mice.

The mushroom, *Ganoderma lucidum* (known in China as lingzhi, and in Japan as reishi or mannentake), appears to work by correcting an unhealthy mix of microorganisms that colonized the guts of [mice](#) made obese by a diet of high-fat chow.

Published Tuesday in the journal *Nature Communications*, the findings of researchers in Taiwan lend credence to the woody mushroom's ancient reputation as a promoter of longevity and digestive health. But they also illuminate the powerful role that [gut microbes](#) appear to play in

obesity and several of the ills associated with it.

Scientists remain uncertain as to which comes first - obesity or a community of gut microbes that is out of whack. But researchers are growing increasingly confident that prebiotics or probiotics - food or supplements that jump-start the growth of protective bacteria in the gut - may help protect against the health effects of overconsumption.

The latest research offers further confirmation of a relatively new theory among researchers: that the insulin resistance and high levels of systemic inflammation often seen in the obese stem in part from a decline in populations of gut bacteria that line the intestines.

Like an army guarding a permeable border, those good bacteria prevent the seepage of toxins produced by other gut bacteria through the gut wall. In mice fed a high-fat diet, those who also got a daily dose of *Ganoderma lucidum* extract for two months retained strong populations of border-guarding bacteria and showed low levels of inflammation in the bloodstream. The obese mice who didn't get the mushroom elixir developed insulin resistance and high levels of inflammation.

Those were among many differences between mice fed a high-fat diet that got the mushroom extract and those that did not. After two months, mice who got only high-fat chow had become obese, with fatty livers and large accumulations of visceral and subcutaneous fat.

Despite consuming the same amount, the mice who got the highest dose of *Ganoderma lucidum* extract - an 8 percent solution made by a biotechnology lab in Taiwan - ended the two-month period of overfeeding at virtually the same weight as mice fed normal chow, with roughly the same levels of fat in their liver. Accumulations of visceral and [subcutaneous fat](#) in the mushroom-treated mice were elevated compared with that in mice fed

regular chow, but much lower than that of their fellow mice on high-fat diets who got no mushroom extract.

The researchers also offered evidence that the protections provided by the mushroom extract were a function of their effect on the bacterial mix in the guts of mice: They conducted a census of [gut bacteria](#) that showed mice who got the mushroom elixir had richer populations of intestinal Bacteroidetes and less dense populations of Firmacutes (a mix that characterizes the guts of normal mice) than did obese mice.

And when they performed fecal transfers from mice who got the mushroom mixture to obese mice who had not, the microbiotic populations of [obese mice](#) changed.

Mushrooms in the *Ganoderma lucidum* family are large and dark, with a shiny surface. Once harvested largely in the wild, since the 1970s they have been mostly cultivated for a large medicinal market throughout Asia. Fermentation appears to boost the mushrooms' production of polysaccharides, which the authors of the current study suggested was the active ingredient in the extract that prevented obesity and its ills in mice.

While promising, the new findings are far short of an endorsement for the lingzhi mushroom as a treatment for obesity. Animal experiments are a first step in showing an agent's potential for treatment. But obesity in free-roaming humans is a far more complex disorder than that of [lab mice](#) who are overfed, and dosages at which the mushroom extract is both effective and safe for continual use are far from certain.

Remember that while [mushrooms](#) made Alice smaller, there were some downsides to her imaginary adventure.

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