

OBESITY

Medicinal mushroom reduces obesity by modulating microbiota

Ganoderma lucidum—a medicinal mushroom used in traditional Chinese medicine—has been reported to have antidiabetic properties. Now, a new study shows that this mushroom also has antiobesity properties, which are mediated



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by modulating the composition of the gut microbiota. The findings raise hope that in the future, this mushroom could be used as a prebiotic to combat obesity and obesity-related metabolic disorders.

The researchers prepared a water extract of *Ganoderma lucidum* mycelium (WEGL), which was isolated and cultured using an advanced biofermentation process, and administered it to high-fat diet (HFD)-fed mice daily for 2 months by oral gavage. Supplementation with WEGL dose-dependently reduced weight gain and both epididymal and subcutaneous fat accumulation in HFD-fed mice compared with untreated controls. Inflammation and insulin resistance were also reduced in WEGL-treated HFD-fed mice compared with untreated controls.

As obesity alters the composition of the gut microbiota in both people and HFD-fed mice, the researchers examined whether WEGL treatment could modulate the gut microbiota. Bacterial 16S RNA sequencing of faecal samples revealed that WEGL treatment reduced the ratio of Firmicutes to Bacteroidetes and levels

of Proteobacteria (characteristics of obesity-associated intestinal dysbiosis) in HFD-fed mice. Moreover, transplantation of faeces from WEGL-treated mice to untreated HFD-fed mice recapitulated the antiobesity and microbiota-modulating effects in recipient mice. Finally, the researchers fractionated the mycelium extract to identify the active ingredient in WEGL. The fraction containing high-molecular-weight polysaccharides (>300 kDa) produced similar antiobesity and microbiota-modulating effects as unfractionated WEGL.

“Although the link between obesity and the gut microbiota is well established, our work is among the first to show that a traditional Chinese medicine can be used as a prebiotic to lose weight,” comments lead investigator John Young.

David Holmes

Original article Chang, C.-J. et al. *Ganoderma lucidum* reduces obesity in mice by modulating the composition of the gut microbiota. *Nat. Commun.* doi:10.1038/ncomms8489