Giant Oyster Mushroom *Pleurotus giganteus* (Agaricomycetes) Enhances Adipocyte Differentiation and Glucose Uptake via Activation of PPARγ and Glucose Transporters 1 and 4 in 3T3-L1 Cells

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**ABSTRACT:** The edible mushroom *Pleurotus giganteus* was tested for its effect on adipocyte differentiation and glucose uptake activity in 3T3-L1 cells. The basidiocarps of *P. giganteus* were soaked in methanol to obtain a crude methanol extract and then fractionated to obtain an ethyl acetate extract. In this study, cell proliferation was measured using an MTT assay, lipid accumulation using an Oil Red O assay, and glucose uptake using a fluorescence glucose uptake assay. Gene expression was measured via real-time polymerase chain reaction analysis with TaqMan primer. Ethyl acetate extract significantly enhanced adipogenic differentiation and glucose uptake in 3T3-L1 adipocytes via the expression of sterol regulatory element-binding protein, peroxisome proliferator-activated receptor γ, and phosphatidylinositol 3-kinase/Akt. Glucose uptake was facilitated by the highly expressed glucose transporters Glut1 and Glut4. Taken together, these results suggest that *P. giganteus* ethyl acetate extract has an insulin-sensitizing effect on adipocytes and has potential as an adjuvant for the management of type 2 diabetes.

**KEY WORDS:** adipocyte, glucose transporters, glucose uptake, medicinal mushrooms, *Pleurotus giganteus*, type 2 diabetes mellitus