

# Alteration in the ultrastructural morphology of mycelial hyphae and the dynamics of transcriptional activity of lytic enzyme genes during basidiomycete morphogenesis

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## Abstract

© 2017, The Microbiological Society of Korea and Springer-Verlag Berlin Heidelberg. The morphogenesis of macromycetes is a complex multilevel process resulting in a set of molecular-genetic, physiological-biochemical, and morphological-ultrastructural changes in the cells. When the xylotrophic basidiomycetes *Lentinus edodes*, *Grifola frondosa*, and *Ganoderma lucidum* were grown on wood waste as the substrate, the ultrastructural morphology of the mycelial hyphal cell walls differed considerably between mycelium and morphostructures. As the macromycetes passed from vegetative to generative development, the expression of the *tyr1*, *tyr2*, *chi1*, *chi2*, *exg1*, *exg2*, and *exg3* genes was activated. These genes encode enzymes such as tyrosinase, chitinase, and glucanase, which play essential roles in cell wall growth and morphogenesis.

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## Keywords

basidiomycete morphogenesis, cell wall ultrastructure, gene expression, lytic enzymes, phenol oxidases

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