

Enhanced production of manganese peroxidase from immobilized *Phanerochaete chrysosporium* due to the increased autolysis of chlamyospore-like cells

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Abstract

Manganese peroxidase(MnP)¹ produced from *Phanerochaete chrysosporium* during the secondary metabolism. MnP is an extracellular heme-containing enzyme known to catalyze the oxidation of Mn²⁺ to Mn³⁺ in a reaction requiring appropriate manganese chelators which in turn can oxidize a variety of recalcitrant aromatic compounds. The stable production was confined to many factors (morphology, protease, agitation, growth medium, pH, oxygen tension) in submerged culture, thus restricting amounts of MnP production. Partially, it has overcome apparently by means of immobilization on support. We observed larger production of MnP in the culture of immobilized *P. chrysosporium* than in the free culture. The autolysis of chlamyospore-like cells which are reported the reservoir of MnP correlated with the production of manganese peroxidase (MnP) in *Phanerochaete chrysosporium* immobilized in polyurethane foam. The maximum specific activity of MnP was 1055 U g dry mycelium⁻¹ in the immobilized culture, compared with 260 U g dry mycelium⁻¹ in the submerged culture. Scattered mycelial pellets were formed in the immobilized culture in which almost all of the chlamyospore-like cells were subject to autolysis. However, highly crowded pellets were formed in the free culture, in which only the chlamyospore-like cells in the exterior were subject to autolysis. We propose that the enhanced production of MnP in immobilized cultures of *P. chrysosporium* is due to increased autolysis of the chlamyospore-like cells.

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Reference

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