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Biosynthetic regulation of production of Antroquinonol from submerged mycelial fermentation of *Antrodia camphorate*: A mechanistic studyPeter Cheung¹ and B B Zhang²¹The Chinese University of Hong Kong, Hong Kong²Jiangnan University, China

Statement of the Problem: Antroquinonol, an important anticancer metabolite derived from the medicinal mushroom *Antrodia camphorate*. Due to the slow growth rate of the fruiting bodies of *A. camphorata* and the rarity of parasitic host, submerged fermentation has been applied to meet the increasing demand on this metabolite derived from *A. camphorata*. However, the yield of antroquinonol was low by conventional submerged fermentation and investigations to increase the yield of this metabolite by stimulatory agents are required.

Methodology & Theoretical Orientation: The present study revealed the plausible mechanisms related to the stimulatory effect of coenzyme Q0, camphorwood leach liquor and soybean oil on the biosynthesis of antroquinonol.

Findings: Addition of coenzyme Q0 could up-regulate the expression of S-adenosylmethionine synthetase, affording methyl group for the biosynthesis of antroquinonol. Heat shock proteins and TCA cycle related proteins were also found to participate in the biosynthetic pathway. Camphorwood leach liquor could provide the precursor of antroquinonol by acting as donor of the quinone nucleus. Soybean oil could increase the permeability of mycelial cell membrane and the extraction efficiency for the intracellular hydrophobic antroquinonol from the mycelia.

Conclusion & Significance: The production of antroquinonol from the mycelial fermentation of *A. camphorate* can be enhanced by stimulating agents such as coenzyme Q0, camphorwood leach liquor and soybean oil. This study advances our understanding on how stimulatory agents can be used to regulate the biosynthetic pathway of valuable metabolites produced from mushroom mycelia and facilitate the development of submerged fermentation for potential industrial application.

Biography

Peter Cheung has expertise in mushroom fermentation technology. He is interested in the production of bioactive metabolites from submerged fermentation of mushroom mycelium as well as solid state fermentation of mushroom fruiting body and sclerotia. He also studies the chemical structure and biological activities of mushroom metabolites and cell wall components for their application as functional food ingredients.

petercheung@cuhk.edu.hk