

Characterization of lipid-excreting mutants derived from arachidonic acid producing filamentous fungus *Mortierella alpina* 1S-4

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INTRODUCTION

In recent times, demands for bio-oils, such as biolipids and biofuels, have progressed, since they are very significant biomolecules for human health and for the ecological preservation of the earth's environment. Extracellular production of lipids by microorganisms is believed to possess great potential for the separation of lipids from culture medium. Compared with intracellular production, extracellular one would facilitate recovery of the product and may also allow an increase in the amount produced. The development of extracellular lipid production, for example under continuous culture conditions, must be promising for an improvement in the cost performance of microbial lipid fermentation.

Previously, we have succeeded to obtain some lipid-excreting mutants derived from *Mortierella alpina* 1S-4, a polyunsaturated fatty acid (PUFA) producing fungus. In this study, we analyzed mechanism of the lipid excretion in order to improve productivity of lipids.

First of all, we analyzed the morphological differences between the wild type and the mutants grown on the nutrient agar plates containing various metabolic inhibitors, intermediates of cell wall biosynthesis, or osmotic stabilizer. As the results, it turned out that high ability in vigorous growth and disability in cell wall biosynthesis are the key factors for the lipid secretion. Therefore, we attempted to over-express chitinase and chitosanase genes to enhance the lipid secretion by the wild type strain. Currently, we are analyzing the effects of the gene manipulation.