

Synthesis of Triacylglycerols in the Oleaginous Yeast *Yarrowia lipolytica*

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The oleaginous yeast *Yarrowia lipolytica* has the ability to produce and store huge amounts of triacylglycerols (TAG). For this reason, this microorganism has become attractive for industrial applications such as single cell oil production. However, *Yarrowia lipolytica* may also serve as a model organism to study lipid turnover in adipocytes, since not only the ability to store excessive amounts of TAG in so-called lipid particles but also the composition of this storage compartment resembles adipocytes of higher eukaryotes. Despite these potentials of *Yarrowia lipolytica* information about TAG (lipid) metabolism in this yeast is rather limited. Thus, we analyzed the proteome of *Yarrowia lipolytica* for candidate genes encoding polypeptides catalyzing the acylation of diacylglycerol yielding TAG. Computational searches highlighted two candidate gene-products homologous to TAG synthases of other organisms. A decreased accumulation of TAG in mutant cells defective in these candidate genes indicated a function of these polypeptides in TAG formation. To investigate whether these candidate genes encode true TAG synthases these genes have been heterologously expressed in cells of a *Saccharomyces cerevisiae* mutant defective in neutral lipid synthesis and as a consequence lacking lipid particles. Analyses of the respective mutant cells by fluorescent microscopy and lipid analyses clearly demonstrate that these *Yarrowia lipolytica* genes encode true TAG synthases. The characteristics of these two TAG synthases from the oleaginous yeast are currently under investigation.

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