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Physiological characterization of three different *Yarrowia lipolytica* strains growing on glycerol, glucose, xylose and arabinose

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The nonconventional yeast *Yarrowia lipolytica* is, due to favorable physiological features, a promising candidate for future biotechnological applications. As an oleaginous yeast *Y. lipolytica* is able to synthesize and accumulate lipids to levels exceeding 50% of cell dry weight (Beopoulos et al., 2009). Besides that, this species can secrete large amounts of organic acids (e.g citric and isocitric acids, α-ketoglutaric acid), produce sugar alcohols (e.g. mannitol, erythritol) and single-cell protein. It can also be used as a platform for the production of various heterologous proteins (e.g. lipases, proteases) (Darvishi Harzevili, 2014). Furthermore *Y. lipolytica* is generally recognized as safe (GRAS). Besides the industrial applications, *Y. lipolytica* is also used as a model organism in several studies of academic interest (Barth, 2013).

The overall goal of this research project is to evaluate *Y. lipolytica*´s potential to be used as a biocatalyst in a biorefinery process where the conversion of agro-industrial wastes and renewable low-cost substrates (such as glycerol) to value added products is desired. A challenge in this context is the seasonal variation in availability and composition of biomass. This study addresses, therefore, the applicability of *Y. lipolytica* as a cell factory for conversion of glycerol and hydrolysates of lignocellulosic materials which mainly consists of fermentable sugars like xylose, glucose and arabinose (Tsigie et al., 2012). A quantitative physiological investigation was carried out in order to assess the cellular performance on different carbon sources and on combinations of these. In this context we were also interested in strain diversity regarding carbon utilization. The DTU in-house strain IBT 446, and the publically available strains W29 and H222 were used in this study.

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