ORTHOLOGUES YEAST GENES ASSOCIATED WITH GLYCEROL TRANSPORT AND METABOLISM

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Glycerol, besides acting as compatible solute, accumulated by S. cerevisiae to counteract the low a\textsubscript{w} stress environments, is a key compound in the regulation of multiple metabolic pathways. Most of the genes involved in glycerol consumption and production are now available for this yeast. Furthermore, three genes had been described as involved in glycerol uptake as well as export, respectively, GUP1/2\textsuperscript{1} and FPS1\textsuperscript{23}. Altogether, these genes regulate intracellular glycerol levels in a way not yet completely unveiled. Some of these mechanisms, like the stimulation of glycerol production and accumulation under stress growth conditions and the presence of constitutively active transport for glycerol, are common to a series of other yeasts\textsuperscript{4}. Being so, we decided to search for some of the genes from glycerol uptake and metabolism in some of those yeasts. We began using the partial genome sequencing available for several yeasts from the Génolevures Program. Further ahead we included Candida albicans from Stanford Genome Sequencing Data Base. Our search focused on GUP1/2, FPS1, GPD1/2 (glycerol 3-P dehydrogenase) and GUT1 (glycerol kinase) genes. From this search we choosed the sequences with higher similarity, which were present in Candida tropicalis, Kluyveromyces marxianus, Kluyveromyces lactis, Kluyveromyces thermotolerans, Pichia angusta, Pichia sorbitophila and Zigossacharomyces rouxii, besides Candida albicans. The entire sequences of the genes were obtained using standard procedures, like primer walking sequencing and RACE (rapid amplification of cDNA ends). Genes were obtained by PCR and complementation analysis was done. Sequences were used to create/enlarge gene families, to explore the evolutionary relationship of these species and to establish the putative relation between sequence and function.

\textsuperscript{1} Holst et al (2000). Molecular Microbiology, 37: 108-124