ACID TREHALASE SECRETION ALLOWS TREHALOSE FERMENTATION BY THE YEAST PATHOGEN *Candida glabrata*

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The yeast *C. glabrata* is an important emergent pathogen as it is the second most common cause of candidiasis. Due to its lower sensitivity to antifungal azoles and high mortality, rapid identification tests are required to choose the appropriate therapeutic treatment. The ability to assimilate only two sugars, glucose and the disaccharide trehalose (Gluα1-1αGlu), has been proposed as a rapid test for identification of this yeast. Our results show that *C. glabrata* consumes and ferments efficiently trehalose, with kinetic parameters and biomass and ethanol productivities similar to those observed during glucose fermentation. During the exponential growth on 20 g/L trehalose up to 2.5 g/L of glucose was accumulated in the medium, suggesting extracellular hydrolysis of the disaccharide. Indeed, *C. glabrata* cells expressed an acid trehalase at the cell surface, and up to 30% of the total enzymatic activity is secreted into the medium during growth on trehalose. The secreted acid trehalase shows a molecular mass of 275 kDa in its native form, but SDS-PAGE analysis revealed a glycoprotein of ~130 kDa, in accordance with the theorical weight of the protein encoded by the *C. glabrata CAGLOK05137g* gene. The enzyme shows a high hydrolytic activity (V_{max} 80 U [mg of protein]$^{-1}$) and relative high affinity (K_m 3.4 mM) for trehalose.

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