Histone modifying proteins Gcn5 and Hda1 affect flocculation in Saccharomyces cerevisiae during high-gravity fermentation - DTU Orbit (23/12/2018)

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The performance of yeast is often limited by the constantly changing environmental conditions present during high-gravity fermentation. Poor yeast performance contributes to incomplete and slow utilization of the main fermentable sugars which can lead to flavour problems in beer production. The expression of the FLO and MAL genes, which are important for the performance of yeast during industrial fermentations, is affected by complex proteins associated with Set1 (COMPASS) resulting in the induction of flocculation and improved maltose fermentation capacity during the early stages of high-gravity fermentation. In this study, we investigated a possible role for other histone modifying proteins. To this end, we tested a number of histone deacetylases (HDACs) and histone acetyltransferases and we report that flocculation is induced in absence of the histone deacetylase Hda1 or the histone acetyltransferase Gcn5 during high-gravity fermentation. The absence of Gcn5 protein also improved utilization of high concentrations of maltose. Deletion of SIR2 encoding the HDA of the silent informator regulator complex, did not affect flocculation under high-gravity fermentation conditions. Despite the obvious roles for Hda1 and Gcn5 in flocculation, this work indicates that COMPASS mediated silencing is the most important amongst the histone modifying components to control the expression of the FLO genes during high-gravity fermentation.

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