# Wrinkled colonies of *Saccharomyces cerevisiae* and the role of *FLO11* gene expression

Colonies of the laboratory *Saccharomyces cerevisiae* strains, the most studied yeast, usually do not reveal structured colony morphology but their colonies are rather smooth. However, *S. cerevisiae* ∑1278 strain is able to form colonies with fluffy morphology when growing on glycerol medium.

This thesis is focused on the role of *FLO11* gene, that encodes a cell wall protein which is critically required for both invasion and pseudohyphae formation, in colony morphology. Haploid *S. cerevisiae* $\sum S^h$ cells growing on media containing nonfermentable carbon sources such as ethanol and glycerol revealed fluffy colony morphology. These carbon sources also promoted enhanced invasive growth, cell cluster formation and cells elongation. Conversely, the cells growing on media containing fermentable carbon sources such as glucose, fructose, galactose, and mannose generated smooth colonies. Northern blot analysis of RNA isolated from cells growing on different carbon sources revealed that carbon sources other than ethanol and glycerol do not significantly affect *FLO11* expression. However, the fluffiness of the colonies growing on different carbon sources positively correlated with the expression of *FLO11*-GFP fusion protein.

Further, the influence of *FLO11* transcription factors Flo8, Mss11, Msn1, and Tec1 on the colony morphology was analysed. The results indicate that *FLO8*, *MSS11*, and *MSN1* genes are necessary to ensure the formation of fluffy colonies. The *S. cerevisiae* $\sum S^h$ Δ*flo11* strain growing on nonfermentable carbon sources formed only smooth colonies showing the essential role of FLO11 gene in the formation of fluffy colonies.

**Keywords:** *Saccharomyces cerevisiae*; *FLO11* expression; colony morphology; invasive growth; fermentable and nonfermetable carbon sources; *FLO8*; *MSS11*; *TEC1*; *MSN1*

**Klíčová slova:** *Sacharomyces cerevisiae*; exprese FLO11; morfologie kolonií; invazivní růst; fermentovatelné a nefermentovatelné zdroje uhlíku; *FLO8*; *MSS11*; *TEC1*; *MSN1*