Abstract

When grown on solid media, yeast cells form colonies, organised structures characteristic for individual species and strains. In a former study, the library of *S. cerevisiae* DNA fragments fused to *lacZ* gene lacking its own promoter was used in order to identify genes exhibiting variable expression during the colony morphogenesis (MINARIKOVA et al. 2001). One of the genes identified was the *CCR4* gene, encoding a protein participating in transcription regulation. Moreover, it was observed that the colonies of *ccr4*Δ strain differed in their morphology from the parental strain colonies.

We aimed to follow the *CCR4* expression pattern in *S. cerevisiae* colonies and characterize the *ccr4*Δ strain with respect to the colony morphogenesis and development. It was revealed that formation of irregular colonies is neither unique to *ccr4*Δ mutant nor typical for a particular functional gene group. Some of the features of the *ccr4*Δ strain have been revealed – e.g. the change in the budding pattern in colonies, the slower increase in number of cells in colonies, the impaired, yet possible growth on glycerol at 37 °C, the delayed as well as prolonged acid-to-alkali transition on GM agar at 28 °C.

The *CCR4* expression in colonies was followed on MM medium using *lacZ* reporter gene as well as on GM by determining the protein level. In both cases the most intense expression was observed at the initial stages of colony development. In order to increase accuracy of the β-galactosidase assay and extend its application to complex media, an insertion cassette containing a *lacZ* gene variant (for an unstable enzyme) under *CCR4* promoter control and enabling its integration into yeast genome was prepared.

Still, more investigation will be required to understand the mechanisms involved in the regulation of colony development and reveal the part that the *CCR4* gene could play in it.