ABSTRACT

The genus *Candida* includes several opportunistically pathogenic species which are common causative agents of the yeast infections in humans. Although current medical research is focused mostly on cancer, AIDS or Alzheimer disease, the problem of systemic candidiases cannot be neglected. These infections represent a real threat to the immunocompromised patients, they are connected with a high mortality rate and expensive medication with poor prognosis. *Pseudomonas aeruginosa* could be an inspiration in a way of how to eliminate the pathogenic yeasts. The bacterium can inhibit growth of the most common yeast species of the genus *Candida, C. albicans.* This effect is based on production of toxic substances by the bacterium and on interaction of the bacterium with the *C. albicans* cell wall, which leads to the lysis of the yeast cells and which is not fully understood. Nevertheless, coexistence of these microorganisms is also possible and their relationship is affected by various factors. Knowledge of these inter-microbial interactions was obtained from studies of diseases and pathologies, during which *C. albicans* + *P. aeruginosa* coinfections occur.

In this thesis I studied mechanisms of interaction between pathogenic yeast *C. albicans* and bacterium *P. aeruginosa* by a) *C. albicans* gene expression monitoring in coculture of *C. albicans* + *P. aeruginosa* b) analysis of filtered culture media of both microorganisms and their cocultures by gass chromatography/mass spectrometry (GC/MS) method.

I found that transcription of 107 genes was changed in the coculture. These genes encode mainly proteins with regulatory function in transcription, translation or protein modification but also other genes were influenced – genes responsible for *C. albicans* cell wall biosynthesis (*KRE5*, ortholog *S.c. MNT2*), small molecule transport (*CDR1*, ortholog *S.c. VBA5*) or amino acids metabolism (*ARO2, ARO7*) and many others. In agreement with the gene expression results, GC/MS analysis revealed decreased production of autoinductor phenethyl alcohol (inhibitor of *C. albicans* hyphal growth) and simultaneously occurrence of unusual oxidized form of another *C. albicans* autoinductor *E,E*-farnesol (inhibitor of hyphal growth, too) in coculture *C. albicans* + *P. aeruginosa.* (In Czech)