Abstract

Protein synthesis is principally regulated at the initiation stage in which eIF4F complex plays an important role. The eIF4F complex contains three subunits – eIF4A, eIF4E and eIF4G. The eIF4E is cap binding protein, the eIF4A is RNA dependent helicase which unwinds secondary structures at mRNA and scaffolding eIF4G protein. The interaction with other translation initiation factors is important for protein synthesis.

The goal of my thesis was to create a new *Saccharomyces cerevisiae* yeast strain with the human eIF4F factor. Firstly I replaced yeast eIF4E protein with human eIF4E protein. I used a cre/loxP recombination to prepare yeast strains with deleted genes *eIF4GI* (huΔ4G1) and *eIF4GII* (huΔ4G2). Characterization of the new yeast strains showed that the human eIF4E protein replaced yeast ortholog factor better than the eIF4E protein from yeast *Candida albicans*. First experiments showed putative role of the eIF4GII protein during the cell growth under the temperature and osmotic stress.

Key words: translation initiation, eIF4E, eIF4G, *Saccharomyces cerevisiae*