

The role of potassium transporters in programmed cell death of yeasts

Abstract

The programmed cell death was originally connected only to ontogenesis of metazoan. It was later shown that it plays an important role in physiological processes too. An insufficiency or an increased rate of the programmed cell death lead to many pathologies. The term apoptosis was taken as synonym for the term programmed cell death but it designates one of its types. Other types of the programmed cell death are not explored so far as apoptosis. The original classification was based on morphological features, however, there is an approach to distinguish them based on biochemical features. The programmed cell death was found in plants too, where its roles are similar to roles in metazoan and, surprisingly, it occurs in unicellular organisms. The prokaryotic mechanism is different but many common features with metazoan apoptosis exist in unicellular eukaryotes. Nevertheless, certain differences led to use of the term “apoptosis-like programmed cell death”. One of the most studied unicellular eukaryotes is a yeast species *Saccharomyces cerevisiae*. There was found a range of metazoan homologues proteins and thus it can be used as a model organism to deepen our knowledge on metazoan apoptosis and to understand the occurrence of such a process in unicellular organisms. The experimental part of this work is focused on the study of the role of potassium ion membrane transporters during glucose induced cell death of the yeast *Saccharomyces cerevisiae*. Potassium exporters Trk1 and Trk2 play a principal role in this process. Proton ATPase Pma1 participates in its regulation too.

(In Czech)

Keywords: programmed cell death, apoptosis, yeasts, *Saccharomyces cerevisiae*, caspases, Trk1, Trk2