

Description for general public

*Molecular mechanism of polyols assimilation by yeast *Yarrowia lipolytica**

The aim of the project is an identification of the enzymes involved in erythritol utilization in *Yarrowia lipolytica*. Microorganisms produce erythritol under high osmotic pressure, to protect the cells from water outflow. Erythritol is a chemical compound that could be found in food naturally, but in small amounts. Due to sweet taste and very low caloric content, it has been used as a sweetener. Most of consumed erythritol is excreted with the urine in unchanged form (more than 90% percent of the dose). However, the recent research in physiology indicates that this compound may undergo some metabolic changes in human body. Moreover, erythritol was identified as a biomarker- human's cells produce it many years before obesity occurrence. The enzymatic pathways responsible for these processes are still unknown, and their identification in complex animal organisms may be extremely difficult. Yeast may become a good model, because despite the simple structure, they perform most of the metabolic pathways in a manner similar to higher eukaryotes. The issue of erythritol metabolism in yeast is also important from the application standpoint, since yeast are used for industrial-scale production of erythritol. The synthesis pathway has already been well described, but for further optimization it is required to learn the processes involved in erythritol utilization. This problem has been observed in yeast *Yarrowia lipolytica*, which efficiently produces erythritol from glycerol or glucose. After the exhaustion of substrate it also begin to assimilate previously produced erythritol. The arrest of this process lead to improvement of production parameters, which was proven in preliminary studies for the project. Our research group identified the protein responsible for induction of erythritol utilization. This discovery is a good starting point for further research on this still unknown metabolic pathway.