

## Abstract

Microorganisms come across dramatically changing conditions in the environment. It is important for them to be agile for a quick and effective response. Signal transduction pathways are essential for this ability. They can sense a broad spectrum of extracellular and intracellular stimuli and regulate a great number of processes in the cell. For unicellular microorganisms, the most essential ability is to sense environmental conditions for proliferation or abnormal stress conditions. One of the most popular model microorganisms, the fission yeast *Schizosaccharomyces pombe*, is used for the signal transduction pathways research. Findings obtained by research on the fission yeast are applicable to other eukaryotic organisms, thanks to the high conservation of the signal transduction pathways between the fission yeast and other eukaryotic organisms. Proliferation-promoting signal transduction pathways promote cell proliferation, growth and mitotic cell cycle in fission yeast. The stress-response signal transduction pathways play an opposite role. They promote cellular defence against stress stimuli and promote the sexual differentiation process alongside meiotic cell cycle. At first sight, the whole machinery may look like a switch mechanism. There is, however, a more complex crosstalk mechanism involved in the regulation machinery between these two types of signal transduction pathways, which will be described in this bachelor's thesis.

**Key words:** *Schizosaccharomyces pombe*, proliferation, stress, signalisation, kinase, antagonism, target of rapamycin, protein kinase A