

Abstract

Methionine is a proteinogenic amino acid which can be in case of its lack synthesized by yeast, in contrast to mammals. Methionine is also indispensable for cells because it is a precursor molecule for S-adenosylmethionine (AdoMet). AdoMet participates in a biosynthesis of other molecules such as polyamines or biotin. AdoMet is a donor of a methyl group in transmethylation reactions of proteins and lipids. Due to this fact, AdoMet is involved in regulation of a variety of cellular processes. Although yeast can synthesize methionine, from energy point of view, it is more advantageous to take and accept methionine from the extracellular environment. Extracellular methionine concentration also affects the expression of permeases involved in its transport into the cell and methionine biosynthesis.

Intracellular availability of methionine is monitored by tRNA thiolation. Cell growth and aging is positively influenced based on the amount of thiolated tRNA. Methionine biosynthesis, translation rate and carbohydrate metabolism are negatively influenced.

Recently, it has been found out that under certain conditions, lack of methionine induces non nitrogen starvation autophagy, rapidly decreases growth rate and extends life-span of cells in *Saccharomyces cerevisiae*.

Study of the role of methionine in the cellular processes may, in the future, contribute to a better understanding of the processes associated with the human aging process.

Key words: Methionine, *Saccharomyces cerevisiae*, autophagy, growth, aging