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Abstract

This lecture is dedicated to the transport of amino acids and other metabolites from bacterial cells. Bacterial active transport systems for excretion of critical cell metabolites such as amino acids have been studied since the late 1990s. The lecture will cover various aspects, such as the cell envelope structure in various bacteria, the classification and types of efflux systems, the general properties of amino acid exporters, and the regulation of the expression of the corresponding genes. The lecture will highlight the role of efflux pumps in various aspects of cell metabolism such as the maintenance of the optimum intracellular concentration of metabolites, excretion of some regulatory molecules and resistance to toxic metabolite analogues. The known efflux pumps of such biotechnologically relevant bacteria as *Corynebacterium glutamicum* and *Escherichia coli* and examples of their application for the construction of industrially significant producer strains will be discussed. The lecture will also focus on the transporter gene search and efflux gene engineering for application in industrial biotechnology.

Biography

Dr. Zakataeva is an assistant professor of genetics and the Head of Laboratory at the Ajinomoto-Genetika Research Institute (AGRI, Russian Federation). She is one of the pioneers in the field of detection, molecular cloning, investigation and practical application of genes encoding the membrane proteins that participate in efflux of different amino acids and nucleosides. Currently Dr. Zakataeva is involved in metabolic engineering of bacterial producer strains. Her latest scientific interests include the development of genetic methods for the design of industrially important *Bacillus* strains and investigation of genes encoding 5'-nucleotidases. A number of her findings have been published in the leading peer-reviewed international journals (Trends Biochem. Sci., FEBS Lett., FEMS Microbiol., Res. Microbiol. Lett., Appl Microbiol Biotechnol., J Ind Microbiol Biotechnol., Plos One, etc.). Dr. Zakataeva also holds over a dozen of international and Russian patents in industrial microbiology.

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