

This work focuses on a structure and a function of prokaryotic signal systems. There are three types of signal systems in bacteria: one-component, two-component and three-component systems. These three systems differ with respect to their structure and number of protein components and domain. I have focused mainly on two-component systems in bacteria despite their occurrence has been confirmed also in lower eukaryotes. Prokaryotic two-component system are the main instruments which help bacteria to differentiate between different stimuli from the environment and to react to them. So far, there were described two types of two-component systems. The first one is the basic system and the second one is the phosphorelay system. Both types of two-component systems contain two indispensable proteins: histidine kinase and response regulator. They are different with respect to their domain structure of proteins and in a mechanism by which they transfer the signal. The signal transmission system consists of two or four steps in case of the basis or phosphorelay systems, respectively. The principle of the signal transmission is the same for both of them, a phosphate group from the histidine kinase is transferred to response regulator. In such manner, response regulator is activated by and is able to regulate the transcription of DNA.