Abstract

Biofilms are formed by microorganisms living together in a hydrated extracellular matrix. Formation of such clusters of bacteria brings many benefits. The increased resistance to antibiotics is the main one. Creating a biofilm is analogous to the development of multicellular organisms. Biofilm cells communicate with each other with signaling molecules. Signaling molecules make the biofilm more compact structure. Extracellular matrix, in which bacteria live, maintains biofilm structure, affects cell adhesion and protects cells against environmental influences. Bacteria also interact with the environment through the extracellular matrix. The matrix is composed of various biopolymers and proteins. Biofilms are a common cause of infections associated with implants. There are several ways to prevent bacteria in biofilm to antibiotics. These include a slow diffusion of substances, a slow growth or an adaptation to stress. The formation of persistent cells that are tolerant to the antibiotics is the cause of their survival as well as a new population may arise from them. The surface proteins are important elements for the formation of biofilms, they facilitate adhesion and subsequent establishment of biofilm. A protein Bap was the first identified protein. Later its homologues were found, such as BapA, Esp, LapA or Bhp. Mycobacteria belong to the bacteria that form biofilms. The formation of biofilms of mycobacteria is influenced by many factors: glycopeptidolipids, mycolic acids in their cell wall, or the availability of CO_2.