

MOLECULAR INTERACTIONS IN BACTERIAL BIOFILMS

Summary

Bacterial biofilm may be defined as a community of microorganisms embedded in an exopolysaccharide matrix and attached to a surface. Formation and maturation of biofilms is connected with production of extracellular polymeric substances. In this process, microorganisms also secrete specific, low molecular signaling compounds, proteins or polysaccharides and their derivatives. Structure of those compounds, synthesis regulation and the way of secretion are different for gram-negative and gram-positive bacteria. The quorum-sensing signal-

ing compounds for gram negative bacteria are acyl homoserine lactones, for gram positive – tioesters containing octapeptides and gamma-butyrolactones, while for eukaryotic cells – furanone derivatives. Molecular interactions between the bacteria themselves, the bacteria in biofilm and the surface, mechanisms of initial attachment, development and change of the biofilm phenotype, and genetic regulation, are important to elucidate the impact of biofilms on medical, industrial, environmental applications.