

Abstract:

Cationic antimicrobial peptides are part of the innate immune system of all organisms. Their properties such as structure, charge, amphipathicity and hydrophobicity make them promising agents with the potential for use not only in treatment of bacterial infections but also against some viruses, parasites, fungi and cancer cells. One of their possible targets is the cytoplasmic membrane, which they permeabilize. This mode of action has several advantages. The important feature of antimicrobial peptides is their selectivity for bacterial membranes, which makes them harmless to eukaryotic host cells. Another advantage is that the development of bacterial resistance against these peptides is more difficult since the action of antimicrobial peptides is rapid. Nevertheless, there appeared some bacterial strains that are insensitive to already used antimicrobial peptides. By using target modification resistant bacteria are able to prevent the bactericidal effects of the antimicrobial peptides. At the level of cytoplasmic membrane bacteria can alter its electrostatic or structural properties of membrane lipids and thus the antimicrobial peptides lose their ability to interact with the membrane and permeabilize it. Understanding the mode of action of antimicrobial peptides and mechanisms by which bacteria can develop resistance against the antimicrobial peptides can help in searching for new effective antimicrobial agents.

Key words: cationic antimicrobial peptides, resistance, cytoplasmic membrane, membrane permeabilization, mode of action, phospholipids