Abstract

Functional membrane microdomains are structural heterogeneities in bacterial cytoplasmic membrane with up to few tens of nanometers in size. Same as in the case of eukaryotic lipid rafts the lipid and protein composition and fluidity of bacterial membrane microdomains differ from the rest of the membrane. Membrane microdomains contain the structural analogues of eukaryotic flotilin as well as hopanoids and carotenoids as functional analogues of cholesterol in eukaryotic lipid rafts. In functional membrane microdomains there are located proteins associated with membrane trafficking, signaling, secretion, biofilm formation, and sporulation. Functional membrane microdomains are specific sites for the entry of certain antibiotics into cells. What is more, disassembly of functional membrane microdomains might be regarded as a possible novel mechanism of bacterial infections suppression that is caused by antibiotic resistant bacterial pathogens. In the absence of membrane domains proteins which require for their functions the membrane domain localization lose their activity. This may result in inhibition of bacterial cell growth.

Key words: Functional membrane microdomains, bacterial cytoplasmic membrane, cardiolipin, hopanoids, flotilins, antibiotic resistance