سمینار هفتگی ماده چگال نرم

Investigation of the molecular mechanism of action of surface acting peptides on biomimetic membranes

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Abstract

Increasing occurrences of multi-drug resistant strains of bacteria act as ominous reminders of the ongoing "arms race" between antibiotics and bacteria; it is imperative to develop new therapeutic agents. Among the alternatives to traditional antibiotics, antimicrobial peptides (AMPs) attract growing interest.

In this presentation, I will describe a systematic study of the interaction between surface acting peptides of different secondary structures with mammalian and bacterial mimetic membranes. First, I studied aurein 1.2 that is one of the smallest AMPs secreted by vertebrates. Aurein 1.2 was chosen as it is believed to act via the carpet mechanism. Our results suggest that Aurein 1.2 acts via aggregation driven membrane penetration.

I continued my studies of surface acting peptides with LL-37. This peptide exhibits high sequence similarity to aurein 1.2 in the reversed sequence of residues 17-29. Based on the results, two different action mechanisms were proposed: in unsaturated lipids and cholesterol containing membranes LL-37 acted as a pore former and in lipids of saturated fatty acids it acted as a membrane modulating agent.

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