The antimicrobial peptides pore formation induce by ginsenoside effect in lipid bilayers

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Abstract

The ginsenoside is extracted from the ginseng. Most people believe it is good for health. Ginsenoside has long been reported to be biologically active, most often as having anticancer, anti-transfer for the tumor and will increase the immunity. In the recent research, we found the ginsenoside has obvious thinning effect and we also found the antimicrobial peptides have thinning effect, too. However, how the ginsenosides influences the peptide state in the lipid bilayers is still not clear. In this paper, we used the lamellar x-ray diffraction(LXD) and the oriented circular dichroism(OCD) to study the ginsenosides effect on the peptides pore formation. The result shows the ginsenosides will induce the melittin to transit into the insertion state more easily. That implies the ginsenosides will first bind to the lipid bilayers and reduce most of the head-group volume of the lipid bilayers. Therefore, the melittin binding to the lipid bilayers will enhance larger deformation energy after the ginsenosides. It also supports that the ginsenosides can effectively control the host membrane and then affects the state of the peptides, so it will induce the peptide to transit into the insertion state from the surface state more easily.