Influence of resveratrol on interactions between negatively charged DPPC/DPPG membranes and positively charged poly-L-lysine.

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Streszczenie

Resveratrol (Res), a natural polyphenol present in different plants and vegetables, exhibits potential therapeutic activity with cardioprotective, antineurodegenerative, antioxidant, and antitumor action. In this study, the effect of Res on the mutual interactions between positively charged poly-l-lysine (PLL) and negatively charged dipalmitoylphosphatidylcholine/dipalmitoylphosphatidylglycerol (DPPC/DPPG) membranes was studied using Fourier-transform infrared (FTIR) spectroscopy supported by principal component analysis (PCA). The interactions between PLL and DPPC/DPPG membranes were strongly affected by the presence of Res molecules. Depending on the Res concentration and method of its supply (through the water or lipid phase) to the studied peptide–membrane systems, the membrane-induced transition of PLL from an α-helix to an extended left-handed polyproline II helix (PPII) occurred at different temperatures, with different cooperativity, or was even completely suppressed. The influence of PLL on the conformational (*trans*/*gauche*) state of the hydrocarbon chain region of the lipid membranes and the hydration state of the polar/apolar membrane interface was also modulated by Res, depending on the membrane phase state.

Słowa kluczowe

poly-l-lysine, DPPC/DPPG membranes, FTIR spectroscopy, principal component analysis, trans to gauche isomerization, hydration of interface region of membranes

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