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ARTICLE

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Effect of cholesterol on bilayer location of the class A peptide Ac-18A-NH_2 as revealed by fluorescence resonance energy transfer

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Abstract An amphipathic class A peptide, Ac-18A-NH_2, has been employed in modeling the α-helical lipid-binding site of apolipoprotein A-I (apoA-I). To gain insight into the nature of protein–lipid interactions responsible for the ability of apoA-I to promote the efflux of intracellular cholesterol, the peptide disposition in model membranes composed of phosphatidylcholine (PC) and its mixture with cholesterol (Chol) has been characterized. By examining resonance energy transfer between the peptide Trp as a donor and anthrylvinyllabeled PC as an acceptor it was found that Chol inclusion is conducive to shallower bilayer location of the Ac-18A-NH_2 α-helix. The limits for the Trp distance from the membrane center were estimated to be 1.5–1.7 nm (PC) and 1.9–2.1 nm (PC:Chol), indicating that in the PC bilayer the Trp resides at the level of the glycerol backbone and carbonyl groups while the region of the phosphocholine moieties is preferable for Trp location in the PC:Chol bilayer. These findings suggest that Chol can modulate the interactions between apoA-I and membrane lipids via reducing the depth of α-helix bilayer penetration.