



Resonance energy transfer study of lysozyme–lipid interactions

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Abstract

Resonance energy transfer (RET) between the tryptophan residues of lysozyme as donors and anthrylvinyl-labeled phosphatidylcholine (AV-PC) or phosphatidylglycerol (AV-PG) as acceptors has been examined to gain insight into molecular level details of the interactions of lysozyme with the lipid bilayers composed of PC with 10, 20, or 40 mol% PG. Energy transfer efficiency determined from the enhanced acceptor fluorescence was found to increase with content of the acidic lipid and surface coverage. The results of RET experiments performed with lipid vesicles containing 40 mol% PG were quantitatively analyzed in terms of the model of energy transfer in two-dimensional systems taking into account the distance dependence of orientation factor. Evidence for an interfacial location of the two predominant lysozyme fluorophores, Trp62 and Trp108, was obtained. The RET enhancement observed while employing AV-PG instead of AV-PC as an energy acceptor was interpreted as arising from the ability of lysozyme to bring about local demixing of the neutral and charged lipids in PC/PG model membranes.

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