

Abstract Submitted
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Dynamics and Self-Assembly of Nanoparticles on Biomembranes¹

RUPAK BHATTACHARYA, VISHAL MAINGI, SUBBARAO KANCHI, Department of Physics, IISc Bangalore, BAGUL RAHUL SURESH, Department of Organic Chemistry, IISc Bangalore, N JAYARAMAN, Department of Organic Chemistry, IISc Bangalore, PRABAL MAITY, Department of Physics, IISc Bangalore, K.G AYAPPA, Department of Chemical Engineering, IISc Bangalore, JAYDEEP BASU, Department of Physics, IISc Bangalore — We have recently been investigating the diffusion mediated self-assembly of various types of Dendrimers on supported DMPC lipid bilayer. Atomic Force Microscopy is used to study the pattern formation for PETIM dendrimers of different core composition as well as of generations. Extensive studies have been carried out using different concentration and different packing of lipid molecules constituting the lipid bilayer. Interestingly Oxygen Core dendrimer forms regular circular patterns on membranes whereas the Nitrogen Core dendrimer do not. A fully atomistic Molecular Dynamics simulation with implicit water clearly shows the evidence of domain formation for O-core dendrimers on bilayer, which is absent in the other one. Different generation for Oxygen core dendrimers forms patterns with a pore inside. The reduction of the diameter of these patterns with decreasing packing of lipid molecules indicates the possible role of lipid molecules in aggregation process. Further study using Confocal Fluorescence Correlation Spectroscopy is underway to correlate this type of membrane mediated pattern formation with underlying lipid diffusion.

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Rupak Bhattacharya
Department of Physics, IISc, Bangalore

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