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Mobility of DNA on supported lipid bilayers CHAKRADHAR PADALA, Rensselaer Polytechnic Institute, RICHARD COLE, Wadsworth Center, SANAT KUMAR, RAVI KANE, Rensselaer Polytechnic Institute — Extensive theoretical ideas have been developed to understand the transport properties of transmembrane proteins in the lipid bilayer. However, of late, there has been a rising interest in understanding the transport properties of non-compact macromolecules strongly adsorbed "on" and not incorporated into lipid bilayers in light of the relevance for designing improved DNA separation strategies and for gene therapy. Previously, researchers like Radler *et al.* have suggested that such strongly adsorbed polymers can be treated similar to a polymer in a two-dimensional fluid, but there exists no experimental proof to date. In order to test this hypothesis and also to gain a better understanding of polymer dynamics in two dimensions, we studied the lateral transport of a short, single stranded DNA oligonucleotide adsorbed on a supported cationic lipid bilayer. Fluorescence Recovery After Photobleaching (FRAP) analysis reveals that diffusivity of the adsorbed DNA quantitatively tracks that of the underlying lipid. These results, along with the comparison between our results for short, non-compact adsorbed biopolymers and those reported for globular proteins incorporated into the lipid bilayer will be discussed.

Chakradhar Padala
Rensselaer Polytechnic Institute

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