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Dynamic DNA Interactions with Functionalized Colloids LU ZHANG, YINGXI ELAINE ZHU, Department of Chemical and Biomolecular Engineering, University of Notre Dame — Many biomedical processes, such as protein adsorption, DNA hybridization and enzyme reactivity, are intimately related to their interactions with surfaces and complex ionic environments, yet the details of biomacromolecular interaction remain insufficiently understood. In this work, we use confocal laser scanning microscopy to examine the interaction between DNA molecules and functionalized colloidal particles in aqueous suspension. We observe an intriguing attractive interaction between DNAs and carboxyl-functionalized silica particles of varied sizes from 50 nm to 3 um, resulting in complex DNA-colloid aggregation with a strong dependence on DNA/colloid size ration and ionic strength. As colloidal size becomes larger than DNA dimensions, colloidal doublets and triplets with adsorbed DNAs are observed at high DNA concentration and ionic strength. The intriguing DNA-colloid complex structures are further confirmed by SEM and appear stable for at least 2 weeks.

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