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**DNA Docking with Functionalized Colloidal Probes** LU ZHANG, YINGXI ELAINE ZHU, Department of Chemical and Biomolecular Engineering, University of Notre Dame — The docking of DNA with probe-functionalized microparticles remains inadequately understood, despite the significance of DNA hybridization-based technologies for high-throughput screening for genetic analysis and biomedical diagnostics. In this work, we employ fluorescence correlation spectroscopy (FCS) and confocal microscopy to examine DNA-colloid interaction and resulting conformational structures of DNA oligomers with oligonucleotide-functionalized colloidal probes, whose particle size varies from 100 nm to 3  $\mu\text{m}$ . We observe that the docking efficiency strongly depends on DNA length, colloid size and surface functionality. Optimal probe size and temperature are found for rapid hybridization. We conjecture that the resulting structure of DNA at the interface of colloidal probes is determined by both steric effects and DNA charge condensation. If time permits, we will discuss our recent work on the docking of elongated DNA with functional probes by imposed dielectrophoretic forces in the presence of AC fields.

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