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## “Electrophoresis and Bending Properties of Polyelectrolytes”

Electrophoresis is a widely used method for separating biological molecules and colloidal suspensions by size, charge, and shape. Physical properties of nucleic acids containing branched, multimer junctions are important in biology, as well as for many emerging applications, including high-throughput DNA sequencing/screening, detection of single nucleotide polymorphisms (SNPs), and for characterizing mechanical properties of DNA. This talk focuses on the effect of junction physical chemistry on electrophoresis of branched random-coil and rigid-rod polyelectrolytes in gels and neutral polymer solutions. For random coil molecules, the electrophoretic mobility in a neutral polymer solution is shown to be coupled to local non-Newtonian hydrodynamics of polymer chains in the electric double layer near polyelectrolyte chain segments. For rigid-rod like polyelectrolytes, entropic trapping in the heterogeneous porous environments present in many gels provides a simple, new tool for separating nucleic acids by base-pair content, bending stiffness, and topology.

**Date: March 25, 2008**

**Time: 4:00 PM (Reception at 3:30 PM in 826 Mudd)**

**Location: 825 Mudd**

**Department of Chemical Engineering**



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