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Biofunctionalized Surfaces

The interface between high-tech media like silicon or silicon dioxide and biological media like proteins or nucleic acids forms the basis for much of the hybrid technology in use. This interface has immense possibilities for the future in the areas of combinatorial detection and synthesis. Interfaces between disparate phases of matter offer large electrostatic fields and density gradients changing the local free energy surface and therefore form a challenging set of problems in current design issues.

The problem of accurately predicting transport properties of fluids over a wide range of densities and temperatures has been a central concern of nonequilibrium statistical mechanics since the early work of Enskog. Recently we compared theories and simulation results. Here those results and projections from our biochip simulations will be discussed in terms of their implications for the design of the next generation of nanofluidic and surface mounted technologies.