Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Biochemistry in the Nanopores SAMIR M. IQBAL[1], Department of Electrical Engineering, NanoFab Center, The University of Texas at Arlington, TX, BALA MURALI VENKATESAN, School of Electrical & Computer Engineering, Birck Nanotechnology Center, Purdue University, West Lafayette, IN, DEMIR AKIN, Weldon School of Biomedical Engineering, Birck Nanotechnology Center, Purdue University, West Lafayette, IN, RASHID BASHIR, Department of Electrical & Computer Engineering and Bioengineering, MNTL, UIUC, IL — Solid-state technology is fast advancing novel nano-structures for biomolecular detection. The solid-state nanopores have emerged as potential replacement of the Sanger's method for DNA sequencing. While the passage of the DNA molecule through the nanopore has been reported extensively, little has been done to identify the individual base pairs or sequences within the molecule. Learning from the mechanics of ion-channels on the cell surface, we functionalized the solid-state nanopores to recognize and selectively regulate the flow of molecules though the pore. The probe DNA was immobilized by chemical adsorption, and target DNA was passed under electrophoretic bias. The single base mismatch selectivity was achieved by using a hairpin loop in the probe. We could thus identify between the perfect complementary and mismatched target molecules. We will expand on the theoretical framework that governs the interactions of the probe and target molecules, as observed from the pulse behavior.

[1]Contact Author

Samir M. Iqbal
Department of Electrical Engineering, NanoFab Center,
The University of Texas at Arlington, TX

Date submitted: 05 Dec 2007 Electronic form version 1.4