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Engineered nanopores for single-molecule detection of proteins

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The underlying principle of nanopore probe techniques is quite simple: The application of a voltage bias across an electrically insulated membrane enables the measurement of a tiny picoamp-scale transmembrane current through a single hole of nanometer size, called a nanopore. Each molecule, translocating through the nanopore, produces a distinctive current blockade, the nature of which depends on its biophysical properties as well as the molecule-nanopore interaction. I will describe our recent strategies for engineering new functional nanopores for single-molecule protein detection, both in organic and silicon-based materials, and with properties that are not encountered in nature. From a practical point of view, this methodology shows promise for the integration of engineered nanopores into nanofluidic devices, which would provide a new generation of research tools in nanomedicine and in high-throughput applications for molecular biomedical diagnosis.

Biography

Liviu Movileanu studied physics 1985-1990 and received a PhD in Biophysics from the University of Bucharest 1997. He held postdoctoral positions at the University of Missouri Kansas City Missouri 1997-1998 and the Texas A&M University Health Science Center College Station Texas 1999-2004. He is currently an Associate Professor of Physics at Syracuse University Syracuse New York.

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