

Abstract Submitted
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Transport of Proteins through Nanopores BINQUAN LUAN, IBM T J Watson Research — In biological cells, a malfunctioned protein (such as misfolded or damaged) is degraded by a protease in which an unfoldase actively drags the protein into a nanopore-like structure and then a peptidase cuts the linearized protein into small fragments (i.e. a recycling process). Mimicking this biological process, many experimental studies have focused on the transport of proteins through a biological protein pore or a synthetic solid-state nanopore. Potentially, the nanopore-based sensors can provide a platform for interrogating proteins that might be disease-related or be targeted by a new drug molecule. The single-profile of a protein chain inside an extremely small nanopore might even permit the sequencing of the protein. Here, through all-atom molecular dynamics simulations, I will show various types of protein transport through a nanopore and reveal the nanoscale mechanics/energetics that plays an important role governing the protein transport.

Binquan Luan
IBM T J Watson Research

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