

DNA translocation through a nanopore in self-assembly peptide membranes

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Recently developed tyrosine-mediated self-assembly peptide film has high mechanical stability and simple fabrication method. Here, we introduce the integration of biological membrane to solid-state nanopore substrates. The self-assembly peptide film is transferred on low noise substrate and acts as a nanopore membrane. Thickness of the peptide film can be adjusted to about 5 nm level (even to 2 nm) and the diameters of the peptide nanopores can be precisely controlled by focused electron beam of minimum spot size. We successfully observed translocations of double-stranded DNA through peptide nanopores with sufficient SNR (signal-to-noise ratio). Our results suggest that self-assembly peptide films can be used as nanopore membranes and utilized as a platform for applying biological functionalities to solid-state substrates.