

Abstract Submitted
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Effect of Orientation in Translocation of Polymers through Nanopores STANISLAV KOTSEV, ANATOLY KOLOMEISKY, Rice University — The motion of a polymer with inhomogeneous structure through a nanopore is discussed theoretically. Specifically, we consider the translocation of polymer consisting of one double-stranded and one single-stranded blocks. Since only the single-stranded chain can pass through the nanopore, the double-stranded segment has to unzip before translocating. Utilizing a simple analytical model, translocation times are calculated explicitly for the different polymer orientations - when the single-stranded block enters the pore first and when the double-stranded one enters first. Their dependence on external fields, energy of interaction in the double-stranded segment, total size of the polymer, and the fraction of double-stranded to single-stranded blocks lengths is analyzed. It is found that the order of entrance into the pore has a significant effect on the translocation dynamics.

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