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(G*) The Journey of a single polymer chain to a nanopore

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The delivery of a polymer chain from the chamber of origin to the destination through a nano-scale pore (nanopore) is called polymer translocation. Transport of RNA and DNA inside and into cells, virus Injection, and drug delivery are only a few examples of biological processes that polymer translocation plays a key role in. Prior to translocation, however, the chain must first find the nanopore. This so-called polymer capture has a significant impact on the conformation of the translocation. Two possible capture conformations are considered single-file and single-folded (hairpin) conformations. Our molecular dynamics-lattice Boltzmann simulations show that the presence of hydrodynamic flow facilitates the finding process as well as fostering the single-file insertion by a hairpin-unravelling mechanism, namely, the pulley effect.

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