

Abstract Submitted
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Conformations and dynamics of a translocating semi-flexible chain through a Nano-pore facilitated by chaperones¹ RAMESH ADHIKARI, ANIKET BHATTACHARYA, University of Central Florida — We have studied the translocation dynamics of a semi-flexible polymer through a nano-pore from *cis* to *trans* compartment containing binding particles (chaperones) which introduce a bias for the translocating chain. We have used a model semi-flexible polymer using excluded volume (Lennard-Jones), anharmonic spring (elasticity), and three-body bond bending (chain stiffness) potentials, and applied Langevin dynamics simulation to study various aspects of conformations and dynamics of the translocating chain. In particular, we have investigated the conditions for the most efficient translocation as a function of the chain stiffness, strength of the attractive interaction, and the density of the binding particles, reflected in the mean first passage time (MFPT) of translocating chain through the pore. We have observed that for certain binding strengths and concentrations of the chaperons, the translocation is faster than the ideal Brownian ratchet (BR) process [Simon *et al.*, Proc. Natl. Acad. Sci. U.S.A. **89**, 3770 (1992)].

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