

Abstract Submitted
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Mechanical model of kinesin moving on microtubule KIWING TO, Institute of Physics, Academia Sinica, YA-CHANG CHOU, YI-FENG HSIAO, KUAN-HUA CHEN, Department of Physics, National Tsing Hua University — Kinesins are biomolecules that serve as intercellular motors for carrying cellular cargos along microtubules. Although the mechanism of converting the chemical energy of ATP to mechanical work is not fully understood, the motion of a kinesin on a microtubule has been measured and two different mechanisms, namely the hand-over-hand and inchworm, has been proposed. The particular shape of kinesin and microtubules suggest a possible mechanism for force generation similar to Brownian ratchet. Using a bead chain connected to two heads that are attracted to a vibrated ratchet plate as a scaled up analog of the kinesin-microtubule system, we manage to simulate both handoverhand and inchworm motion [Chou, et. al., *Physica A*443, 66 (2015)]. In addition, we find that chain, which play the role of the stalk in a kinesin molecule, can also generate force by interacting with the ratchet plate [Chen, et. al. *Phys. Rev. E*87, 012711 (2013)].

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