Review of: "Modeling the processive movement of dimerized kinesin-10 NOD motors"

Tianfu Gao[1]

1 Shenyang Normal University

Potential competing interests: No potential competing interests to declare.

The author studied three models for the processive movement of the dimerized NOD motor, and studied the dynamics of the NOD motor dimer theoretically. In my opinion, there are two very important significance for processive movement of the NOD motor. First, the author propose three models based on the transport features and prior experimental data observed in nucleotide-dependent affinity of the NOD head to microtubule, so the physical mechanism of the dimerized NOD motor is more clear. Second, especially for Model 3, the author skillfully analyzed the processivity of dimerized NOD motor based on experimental data and statistical physics theory, therefore the parameters, i.e. velocity and stepping ratio and run length and so on, can be obtained theoretically. The ideas, the motivation and the models are clearly exposed. In my opinion, this is an interesting work and deserves to be published here.

By the way, I think the author should give some explanations. For example:

1) P11 line 1 from bottom, the author take $k(+)/k(-) = 60$ for the dimerized motor. However, in the calculation of Figure 4a, $k(+)/k(-) = 2$ is used.

2) Generally speaking, for the negative load forces, the motor will generate negative current. The result obtained in this article, as shown in Figure 4a, are positive velocity for backward load.

3) P13, how did the run length (Eq. (7)) come from ?