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

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Potential competing interests: No potential competing interests to declare.

This is a remarkable piece of work that provides a detailed study of the three models for the purpose of comprehending the physical process that underpins the movement of the dimerized NOD motor on MT. The authors provide a detailed comparison between Model 1 and Model 2, as well as the predominant model presented in the literature for the kinesin-1 motor, and they show that these models lead to the non-processivity for the dimerized NOD motor. The authors also show that the prevailing model for the kinesin-1 motor. The authors continue their discussion by presenting Model 3, which is derived from the model for the kinesin-1 motor. They then demonstrate that this model is capable of providing a satisfactory explanation for the processive movement of the dimerized NOD motor. The processive movement of the dimerized NOD motor is consistent with the theoretical findings when Model 3 is used as the foundation. It would be interesting to further test Model 3 by carrying out experiments utilizing approaches that involve optically capturing a single molecule. In reference to the statement that "dimerized KID has a similar chemomechanical coupling pathway to dimerized NOD," it would be extremely beneficial to investigate this similarity further in order to acquire a better understanding of the effects that this chemomechanical coupling has on both proteins. It is necessary to conduct additional research in order to determine whether or not the similarities are merely coincidental and whether or not they are in fact caused by a shared mechanism of action. The theoretical conclusions that are presented here are comprehensive, and the writing is done in a way that is straightforward and succinct, which makes it accessible to readers who come from a range of backgrounds. The paper's models and results are noteworthy and contribute to a better understanding of the dynamics of the motor and its movement.