COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK
DEPARTMENT OF BIOMEDICAL ENGINEERING

Jialan Zhang
JoVE Science Editor
JoVE

Wednesday, September 5, 2018

Dear Dr. Zhang,

We would like to submit our manuscript entitled "Assembling molecular shuttles powered by reversibly attached kinesins" to JoVE to be considered for publication as a video journal article.

The behavior of active nanosystems have so far been characterized by long-lived, nearly irreversible bonds between their components and the surface with which they interact. For instance, in the well-studied example of the microtubule-kinesin system, gliding microtubules are typically propelled by irreversibly surface-bound kinesin motors. Our manuscript presents a protocol that describes how to create kinesin-powered molecular shuttles with a weak and reversible attachment of the kinesins to the surface. To achieve this, we use complex laboratory techniques including UV-Vis spectrophotometry; silanization of coverslips; and total internal reflection fluorescence (TIRF) microscopy. By following this protocol, one will observe that as microtubules glide in a flow cell, they accumulate kinesin motors from solution. Furthermore, as the microtubules move forward, a trail of kinesin motors is left behind them. This trails then slowly desorbs from the surface.

This work continues our investigation into the applications of kinesin powered molecular shuttles and follows our previous publication in JoVE (Jeune-Smith, Y., Agarwal, A., Hess, H. Cargo Loading onto Kinesin Powered Molecular Shuttles. J. Vis. Exp. (45), (2010)), which has already been viewed more than 4,000 times.

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Thank you for giving our manuscript your fullest consideration!

With best regards,

Henry Hess, Ph.D.
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Editor-in-Chief, IEEE Transactions on NanoBioscience