

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: TRAK2 moves processively to the microtubule plus-end. Representative video showing a single TMR-Halo-TRAK2 particle (red) moving toward the dynamically growing plus-end of a surface-attached dynamic MT (cyan). The MT plus-end (right) is evident by the faster growth rate. Scale bar is 5 μm . Stopwatch shows time in minutes: seconds.

File Name: Supplementary Movie 2

Description: KIF5C displays infrequent movement along microtubules when expressed alone. Representative video showing a single Myc-KIF5C-Halo-TMR particle (red) moving along a surface-attached dynamic MT (cyan). Scale bar is 5 μm . Stopwatch shows time in minutes: seconds.

File Name: Supplementary Movie 3

Description: TRAK2 induces robust KIF5C movement along microtubules. Representative video showing many Myc-KIF5C-Halo-TMR particles (red) moving along a surface-attached dynamic MT (cyan) when HA-TRAK2 is co-expressed. Scale bar is 5 μm . Stopwatch shows time in minutes: seconds.

File Name: Supplementary Movie 4

Description: TRAK2 moves processively to the microtubule minus-end in the presence of exogenous HA-LIS1. Representative video showing a single TMR-Halo-TRAK2 particle (red) moving toward the minus-end of a surface-attached dynamic MT (cyan) when HA-LIS1 is expressed. The MT plus-end (right) is evident by the faster growth rate. Scale bar is 5 μm . Stopwatch shows time in minutes: seconds.

File Name: Supplementary Movie 5

Description: TRAK2 switches directions during processive movement. Representative video showing a single TMR-Halo-TRAK2 particle (red) reversing direction while moving processively along a microtubule (cyan). Scale bar is 5 μm . Stopwatch shows time in minutes: seconds.

File Name: Supplementary Movie 6

Description: TRAK2, kinesin-1, and dynein co-migrate as a complex. Representative video with JF646-SNAP-TRAK2 (top channel, cyan), Myc-KIF5C-Halo-TMR (second channel, red), DHC-GFP (third channel, green), and merge (bottom channel) showing these components comigrating as a single complex along an unlabeled microtubule. Scale bar is 2 μm . The movie is 36 seconds of real time.