

### Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: A representative TIRF time-lapse movie (4min) of AP2M1-tagRFP-T (magenta) and DNM2-tagGFP2 (green) in AD cells. Scale bar: 5 $\mu$ m. Acquisition: 1 s/frame. Frame rate: 10 frames/s. Related to Supplementary Fig. 1.

File Name: Supplementary Movie 2

Description: A representative TIRF time-lapse movie (4min) of AP2M1-tagRFP-T (magenta), DNM2-tagGFP2 (green), and JF635 ligand-conjugated ARPC3- HaloTag (cyan) in ADA cells. Scale bar: 5 $\mu$ m. Acquisition: 1 s/frame. Frame rate: 10 frames/s. Related to Fig. 2 and Supplementary Fig. 1, 2.

File Name: Supplementary Movie 3

Description: A representative Airyscan time-lapse movie (3min) of DNM2-tagGFP2 (red) and JF635 ligand-conjugated ARPC3- HaloTag (cyan) on the ventral plasma membrane of ADA cells. The highlighted region is shown in Fig. 3a. Scale bar: 5 $\mu$ m. Acquisition: 0.2 s/frame. Frame rate: 50 frames/s. Related to Fig. 3.

File Name: Supplementary Movie 4

Description: A representative TIRF time-lapse movie (4min) of multi-fluorescence beads (488nm channel: green, 561nm channel: magenta, 640nm channel: cyan). Scale bar: 5 $\mu$ m. Acquisition: 1 s/frame. Frame rate: 10 frames/s. Related to Supplementary Fig. 5.

File Name: Supplementary Movie 5

Description: A representative TIRF time-lapse movie (4min) of AP2M1-tagRFP-T (magenta), DNM2-tagGFP2 (green) and JF635 ligand-conjugated HaloTagN-WASP (cyan) in ADW cells. Scale bar: 5 $\mu$ m. Acquisition: 1 s/frame. Frame rate: 10 frames/s. Related to Fig. 6.