

1 **Description of Additional Supplementary Information**

2 3 **Supplementary Movie 1. Time-lapse FRAP imaging of GFP-FtsN fusion cells.**

4 Half of the ring in the cell on the right was bleached (cyan arrow). The cell on the left
5 served as a control (yellow arrowhead). Images were acquired every 1 s for 150 s after
6 photobleaching, with a 50-ms exposure time. Scale bars, 500 nm.

7 8 **Supplementary Movie 2. Time-lapse TIRF-SIM imaging of a mNG-FtsN fusion cell.**

9 Images were acquired every 1 s for 40 s, with a 50-ms exposure time. Scale bars, 500 nm.

10 11 **Supplementary Movie 3. SMT imaging of a cell with an immobile JF646-FtsN-Halo^{SW}** 12 **molecule.**

13 Images were acquired every 1 s for 150 s, with a 100-ms exposure time. Scale bars, 500
14 nm.

15 16 **Supplementary Movie 4. SMT imaging of a cell with a processively moving JF646-** 17 **FtsN-Halo^{SW} molecule.**

18 Images were acquired every 1 s for 150 s, with a 100-ms exposure time. Scale bars, 500
19 nm.

20 21 **Supplementary Movie 5. SMT imaging of a cell with a JF646-FtsN-Halo^{SW} molecule** 22 **switching between the stationary state and moving state with different speeds.**

23 Images were acquired every 1 s for 150 s, with a 100-ms exposure time. Scale bars, 500
24 nm.

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