JCB

Nakamura et al., https://doi.org/10.1083/jcb.201708130

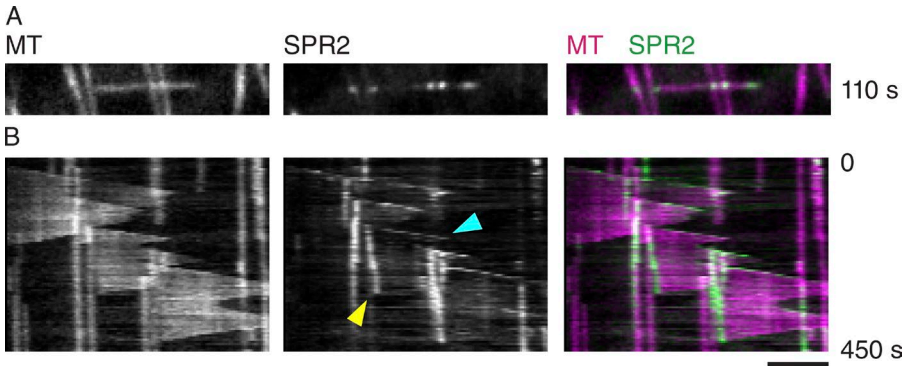


Figure S1. **Dynamic MT labeling of SPR2-GFP on mCherry-TUA5–labeled MTs in 3-d-old dark grown seedlings. (A)** Single image of SPR2-GFP foci on an MT. **(B)** Kymograph of the dynamic colocalization of SPR2-GFP on mCherry-TUA5–labeled MTs. The blue and yellow arrowheads indicate plus and minus end localization of SPR2-GFP, respectively.

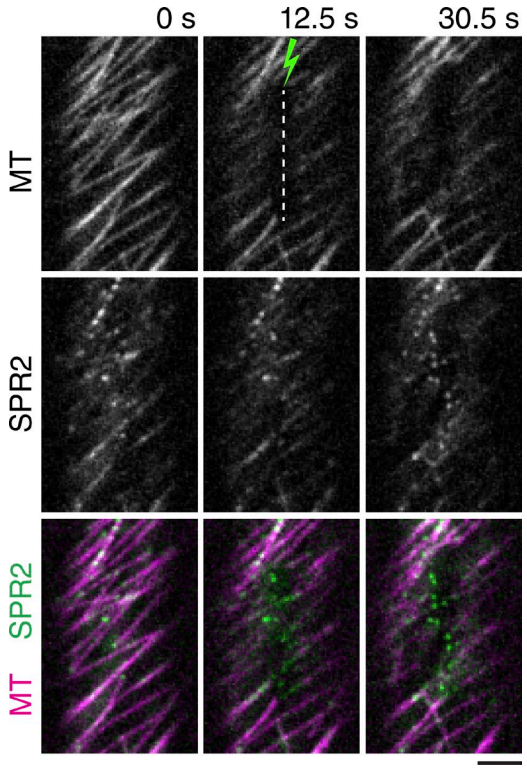


Figure S2. **Representative images of mCherry-TUA5–labeled MTs and SPR2-GFP before and after photoablation.** The green lightning bolt and white dashed line indicate photoablations and the area of photoablation, respectively. Bar, 3 µm.

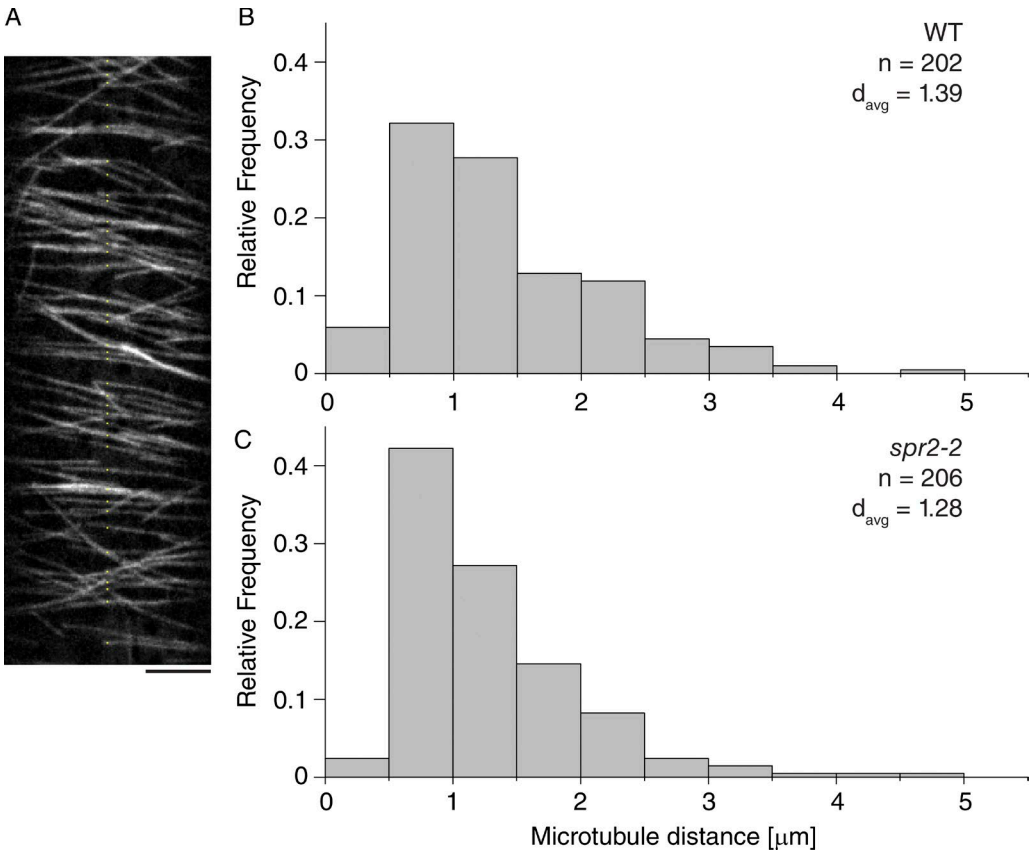


Figure S3. **Transverse MT spacing distribution. (A)** Dark-grown *spr2-2* hypocotyl cell expressing mCherry-TUA5 with detected MTs (Materials and methods) along the vertical midline indicated by dots. Bar, 5 µm. **(B and C)** Distribution of MT distance between longitudinal MTs in WT (B) and *spr2-2* (C).

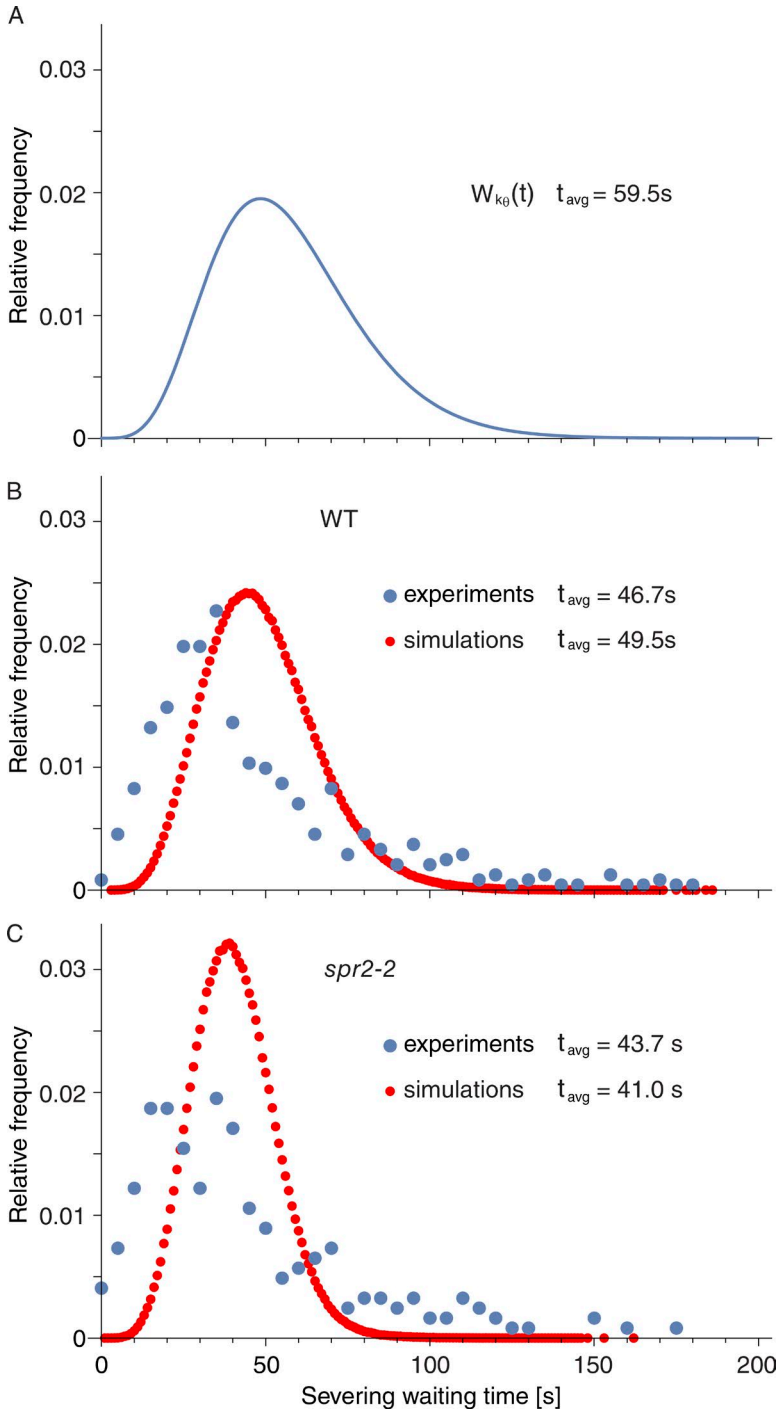
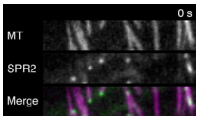
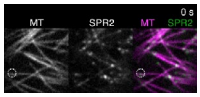


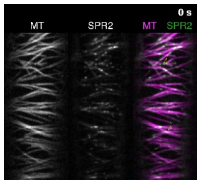
Figure S4. **Intrinsic, conditional, and observed waiting distributions for severing at microtubule crossovers. (A and B)** The optimal intrinsic waiting time distribution (A) and the resultant computed conditional waiting distributions (red dots) compared with the observed distribution (blue dots) in WT cells (B). **(C)** The computed conditional and observed waiting distributions in *spr2-2* cells.



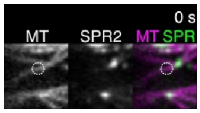
Video 1. **Time series showing dynamic localization of SPR2-GFP– (green) and mCherry-labeled cortical MTs (magenta) in etiolated hypocotyl cells.** Yellow arrowheads and blue arrowheads indicate SPR2 signal tracking minus ends and plus ends, respectively. Images were acquired at 5-s intervals.



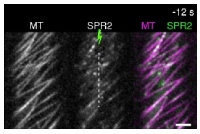
Video 2. **Time series showing dynamic localization of SPR2-GFP– (green) and mCherry-TUA5–labeled cortical MTs (magenta) in etiolated hypocotyl cells.** Dotted circle indicates the site where new MT initiates in a branching manner and is subsequently severed from its initiation site, creating a free minus end. The blue and yellow arrowheads indicate the MT plus end and labeled SPR2 protein tracking the dynamic minus end, respectively. Images were acquired at 5-s intervals.



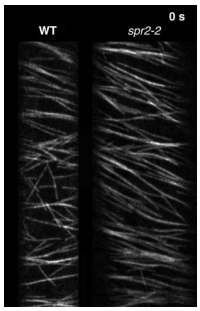
Video 3. **Time series showing dynamic localization of SPR-GFP– (green) and mCherry-labeled cortical MTs (magenta) etiolated hypocotyl cells.** The yellow open arrowheads indicate labeled SPR2 protein tracking the dynamic minus end. Images were acquired at 5-s intervals



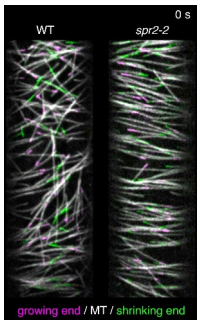
Video 4. **Time series showing dynamic localization of SPR2-GFP– (green) and mCherry-labeled cortical MTs (magenta) in etiolated hypocotyl cells.** Dotted circle indicates a site where an MT crossover is made and the newer MT is severed. The blue arrowhead and yellow arrowheads indicate the newly generated MT plus end and labeled SPR2 protein tracking the new minus end, respectively. Images were acquired at 5-s intervals.



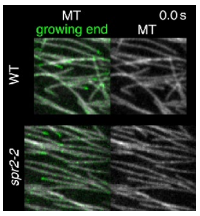
Video 5. **SPR2-GFP decorates MT minus ends generated by photoablation.** Time series showing dynamic localization of SPR2-GFP– (green) and mCherry-TUA5–labeled cortical MTs (magenta) in etiolated hypocotyl cells. MTs were severed by a 532-nm pulsed laser. The area of photo-ablation is indicated by the dotted-line and green lightning bolt. Images were acquired at 2-s intervals.



Video 6. **Time-lapsed images showing comparison of cortical MT array reorientation in etiolated hypocotyl cells of WT and *spr2-2* mutant seedlings stimulated by blue light perception.** Array reorientation in *spr2-2* is significantly inhibited. MTs are labeled with mCherry-TUA5. Images were acquired at 5-s intervals.



Video 7. **Time-lapsed imaging of cortical MT arrays in etiolated hypocotyl cells of WT and *spr2-2* mutant seedlings expressing mCherry-TUA5.** Image processing using a time-phased subtraction (Materials and methods) was used to detect growing and shrinking ends, displayed here as magenta and green comets, respectively. Highlighting growth and shrinkage in this way is a useful aid for visualizing MT-end dynamics. Images were acquired at 5-s intervals.



Video 8. **Example of image series of cortical MTs in WT and *spr2-2* dark-grown hypocotyl cells showing crossovers detected (yellow + signs) used for quantitative analysis.** MTs are labeled with mCherry-TUA5. Images were acquired at 5-s intervals. All the identified crossovers are marked with yellow + signs. Growing plus ends are shown in green.

Provided online is Table S1 in Excel, showing model input parameters.