Supplemental Data: Movies

In all following Supplemental Movies (except SMovie 3 and 9), Z-Stacks progress from the abaxial (lower) surface of the leaf, to the adaxial (upper) leaf surface, and the blue arrows indicate procambium and young vascular tissues located next to MIs. MIs are indicated by white arrows. MIs can be seen before the procambium appears. Guard Cells marked by pink arrows. PI (red) staining labels cell walls. All images are from first leaves 12 Days After Germination (DAG) (except SMovie 6 and 9). Three still frames (first, middle, last) of each movie are shown in Supplemental Figures.

Supplemental Movie 1. *ProFAMA:GFP* expression in mature seed cotyledon. MIs visualized by *FAMA* expression. Scale bar = 50 μm.

Supplemental Movie 2. *ProFAMA:cFAMA-GFP* expression in differentiating hydathode region. MI nucleus marked by *FAMA-GFP*. Scale bar = 50 μm.

Supplemental Movie 3. High magnification of *ProFAMA:cFAMA-GFP* expression in young and elongating MI. MI nucleus marked by *FAMA-GFP*. The Z-Stacks progress from the adaxial (upper) leaf surface, to the abaxial (lower). Young MIs can be seen after the procambium appears. Scale bar = 20 μm.

Supplemental Movie 4. *ProFAMA:GFP* expression in a differentiating hydathode region. MIs can be visualized by *FAMA* expression. Scale bar = 50 μm.

Supplemental Movie 5. High magnification of *ProFAMA:GFP* expression in differentiating hydathode region. MIs appear before the procambium. This Z-stack is the higher magnified Supplemental Movie 4. Scale bar = 20 μm.

Supplemental Movie 6. *E1728* expression in differentiating hydathode region. MI ER is marked by *E1728*. The images were taken from 7 DAG first leaf. Scale bar = 50 μm.

Supplemental Movie 7. *ProATHB8:HTA6-YFP* expression in differentiating hydathode region. Procambial nucleus is marked by the At-*HB8* construct. Scale bar = 50 μm.

Supplemental Movie 8. *Q0990:GFPer* expression in differentiating hydathode region. Procambial cell ER is marked by *Q0990.* Scale bar = 50 μm.

Supplemental Movie 9. High magnification of *Q0990:GFPer* expression in differentiating hydathode region. Procambial cell ER is marked by *Q0990.* In this movie, the Z-Stacks progress in the opposite direction *i.e.* from the adaxial (upper) leaf surface, to the abaxial (lower). MIs can be seen after the procambium appears. The images were taken from 8 DAG first leaf. Scale bar = 20 μm.

Supplemental Movie 10. *spch-1* mutant leaf. MIs (white arrows) appear before narrow phloem strand. Scale bar = 50 μm.

Supplemental Movie 11. *mute* mutant leaf. MIs appear before narrow phloem strand. Scale bar = 50 μm.

Supplemental Movie 12. *ProSPCH:SPCH-GFP* expression in differentiating hydathode region. Yellow arrows indicate meristemoid cells in stomatal lineage. Scale bar = 20 μm.

Supplemental Movie 13. *ProMUTE:MUTE-GFP* expression in differentiating hydathode region. Yellow arrows indicate young Guard Mother Cells. Scale bar = 20 μm.

Supplemental Movie 14. *ProDR5:3XVENUS-N7* expression near differentiating procambium region. *DR5* is expressed in the nucleus; the PI signal is located in cell walls. MIs appear before procambium. Scale bar = 10 μm.

Supplemental Movie 15. *ProDR5:3XVENUS-N7* and *ProPIN3:PIN3-GFP* expression near differentiating hydathode region. *DR5* is expressed in nucleus and *PIN3-GFP* expression is located in the cell membrane. Scale bar = 20 μm.

Supplemental Movie 16. *ProPIN1:PIN1-GFP* expression near differentiating hydathode region. *PIN1-GFP* expression is present in the cell membrane. MIs appear before procambium. Scale bar = 20 μm.