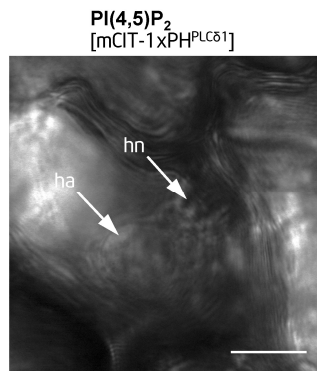


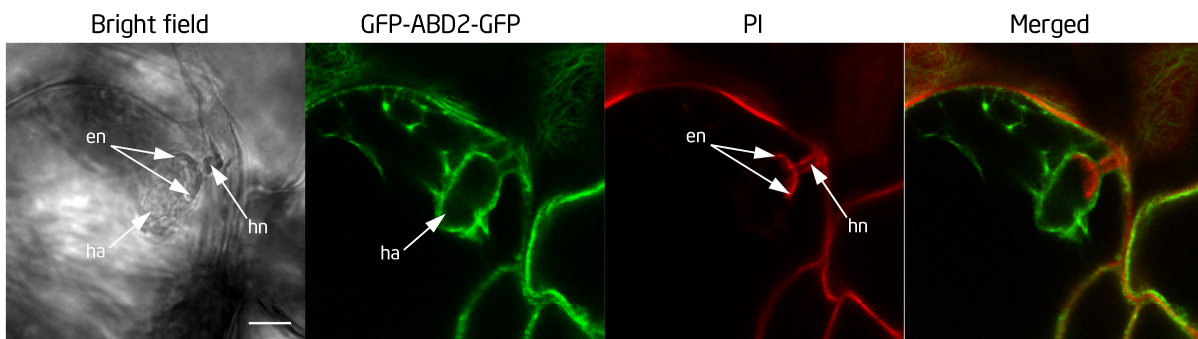
**Supplemental Movie 1.** Z-stack Images Showing the Spatial Distribution of PI4P at the Penetration Site of Powdery Mildew *E. cichoracearum*.

Leaves of *Arabidopsis* expressing mCIT-2xPH<sup>FAPP1</sup> were inoculated with *Ec* conidiospores. At 24 hours post inoculation, the infection site was viewed under confocal microscope. ha, haustorium; hn, haustorial neck. Scale bars, 10  $\mu$ m.



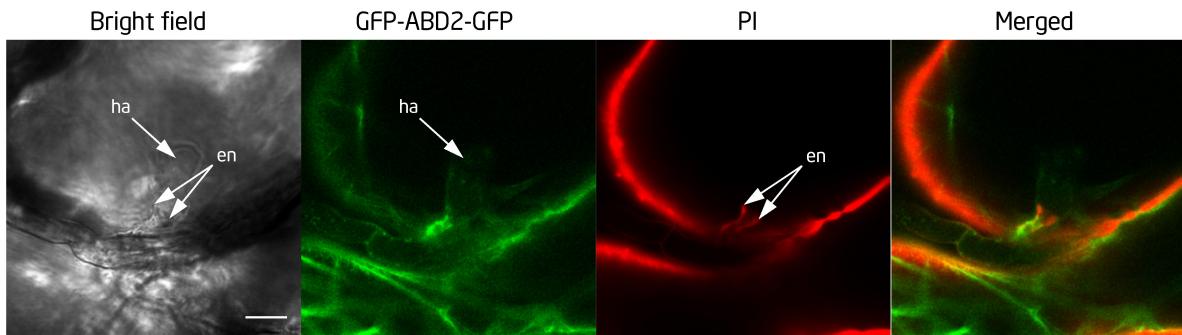
**Supplemental Movie 2.** Z-stack Images Showing the Spatial Distribution of PI(4,5)P<sub>2</sub> at the Penetration Site of Powdery Mildew *E. cichoracearum*.

Leaves of *Arabidopsis* expressing mCIT-1xPH<sup>PLC $\delta$ 1</sup> were inoculated with *Ec* conidiospores. At 24 hours post inoculation, the infection site was viewed under confocal microscope. ha, haustorium; hn, haustorial neck. Scale bars, 10  $\mu$ m.

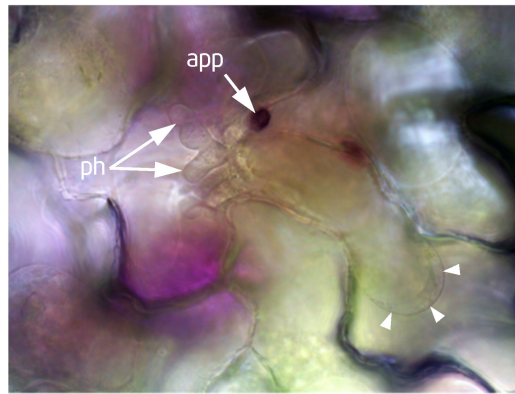


**Supplemental Movie 3.** Z-stack Images Showing the Actin Filaments in Epidermal Cells of Col-0 Leaves Hosting a Mature Haustorium of Powdery Mildew *E. cichoracearum*.

Leaves of *Arabidopsis* expressing GFP-ABD2-GFP were inoculated with *Ec* conidiospores. At 48 hours post inoculation, the infection sites were viewed under confocal microscope. Host cell walls were stained with PI (red). ha, haustorium; hn, haustorial neck; en, encasement. Scale bars, 10  $\mu$ m.



**Supplemental Movie 4.** Z-stack Images Showing the Actin Filaments in Epidermal Cells of *pip5k1 pip5k2* Mutant Leaves Hosting a Mature Haustorium of Powdery Mildew *E. cichoracearum*. Leaves of *pip5k1 pip5k2* mutant expressing GFP-ABD2-GFP were inoculated with *Ec* conidiospores. At 48 hours post inoculation, infection sites were viewed under confocal microscope. Host cell walls were stained with PI (red). ha, haustorium; en, encasement. Scale bars, 10  $\mu$ m.



**Supplemental Movie 5.** Z-stack Images of Epidermal Cells of *pip5k1 pip5k2* Mutant Leaves Inoculated with *C. higginsianum*. Leaves of the *pip5k1 pip5k2* mutant plants were inoculated with *Ch* conidiospores. At 4 days post inoculation, the inoculated leaves were incubated in 0.85 M KCl for 30 min. After plasmolysis, infected leaf tissues were viewed under light microscope. Retracted PM from the cell wall after plasmolysis is indicated by arrow heads. app, appressorium, ph, primary hyphae.