

## Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: The Rab5- to-Rab7 conversion during macropinocytosis in Dictyostelium. Corresponds to Figure 1e. Images were captured at 3 sec per frame and played back at 5 frames per second. Scale bar = 5  $\mu\text{m}$ .

File Name: Supplementary Movie 2

Description: Time-lapse imaging of GFP-Rab5A<sup>REMI</sup>/WT cells pre-incubated with DQ-BSA. Images were acquired after DQ-BSA was washed out. Corresponds to Figure 1f. Images were captured at 3 sec per frame and played back at 5 frames per second. Scale bar = 5  $\mu\text{m}$ .

File Name: Supplementary Movie 3

Description: Localization of GFP-tagged PripA-PH, PripA- $\Delta$ PH, and PripA during macropinocytosis. Corresponds to Figures 2b, c, and d. Images were captured at 6 sec per frame and played back at 3 frame per second. Scale bar = 5  $\mu\text{m}$ .

File Name: Supplementary Movie 4

Description: Localization of GFP-Rab5A<sup>REMI</sup> and PripA-RFP during macropinocytosis. Corresponds to Figure 5d. Images were captured at 3 sec per frame and played back at 5 frames per second. Scale bar = 5  $\mu\text{m}$ .

File Name: Supplementary Movie 5

Description: Localization of GFP-Rab7A and PripA-RFP during macropinocytosis. Corresponds to Figure 5e. Images were captured at 3 sec per frame and played back at 5 frames per second. Scale bar = 5  $\mu\text{m}$ .

File Name: Supplementary Movie 6

Description: Colocalization of PripA-RFP and GFPTbcrA during macropinocytosis. Corresponds to Figure 6d. Images were captured at 6 sec per frame and played back at 3 frames per second. Scale bar = 5  $\mu\text{m}$ .

File Name: Supplementary Movie 7

Description: The Rab5- to-Rab7 conversion during phagocytosis in Dictyostelium. Corresponds to Supplementary Figure S9a. Images were captured at 6 sec per frame and played back at 3 frames per second. Scale bar = 5  $\mu\text{m}$ .

File Name: Supplementary Movie 8

Description: Localization of PripA-GFP during phagocytosis. Corresponds to Supplementary Figure S9b. Images were captured at 6 sec per frame and played back at 5 frame per second. Scale bar = 5  $\mu\text{m}$ .

File Name: Supplementary Movie 9

Description: . The Rab5- to-Rab7 conversion during macropinocytosis in HT1080 cells. Corresponds to Supplementary Figure S12. Images were captured at 6 sec per frame and played back at 20 frames per second. Scale bar = 5  $\mu\text{m}$ .