



**Supplementary Figure 1. Non-uniform distribution of phosphatidylinositol 4,5-bisphosphate (PIP2) in lipid-stabilized water-in-oil emulsions.** Fluorescence micrographs of PIP2 distribution visualized with PLC $\delta$ 1 pleckstrin homology domain fused to GFP (PLC $\delta$ 1-GFP). **(a)** PLC $\delta$ 1-GFP in purely PC-stabilized droplets are only found in the droplet interior. **(b-c)** Emulsions prepared with PIP2 result show two populations of droplets, one subset with no apparent PIP2, and another subset (yellow arrows) with patches of PIP2 at the interface. Scale bar: (a-b) 25 $\mu$ m, (c) 50  $\mu$ m.