Dissection of signaling and trafficking events in malaria parasite

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Polyphosphorylated-Phosphoinositides (PIPs) regulate a wide-variety of signaling and trafficking events in most eukaryotic cells. However, there is little information about the role and metabolism of PIPs in malaria parasite. Initial trends suggest that phosphoinositides may be important for several parasitic processes. We have identified a PI-3 kinase homologue present in *P. falciparum*, PfPI3K. In addition to catalyzing the formation of phosphatidylinositol-3-phosphate (PI3P), PfPI3K appears to generate PI(3,4)P2 from PI4P. We have found that PfPI3K plays an important role in trafficking of host proteins to the parasite. A FYVE domain containing protein (FCP) was identified as a putative target of PfPI3K as it binds PI3P and is targeted to the food vacuole of the parasite. Protein kinase B (PKB) is a major target of phosphoinositide signaling in mammals. In contrast, PfPKB, a PKB like kinase from *P. falciparum*, is not regulated directly by phosphoinositides. It is regulated by calcium sensor protein calmodulin and may play a role in invasion of erythrocytes by the parasite.