Host cell signaling during red blood cell invasion by Plasmodium falciparum

The essential nature of host cell signalling during Plasmodium merozoite invasion makes it an attractive target for novel intervention methods for the disease. At this stage the exact mechanism of this signalling process has not be elucidated but preliminary studies have indicated that Calcium signalling is a critical and conserved part of this signalling cascade across the different Plasmodium species during their invasion into human erythrocytes. In P. falciparum the responsible ligand-receptor pair triggering calcium influx has been identified as PfRh5 and Basigin respectively. In eukaryotic cells, the induction of calcium signalling is tightly regulated and involves extracellular stimulus, cell surface molecular interaction and signal transduction for the activation of calcium channel on the cell surface. This signalling cascade may involve the GPCRs, G-proteins, Adenylyl Cyclases, and intracellular kinases like PKA and PKC. How the malaria parasite manipulates these host cell pathways during invasion is not known. We have attempted to dissect the host cell-signalling cascade that is activated upon PfRH5 binding and show that host cell signalling molecules can be targeted to block merozoite invasion.

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