

## **'Know thy enemy': Malaria parasite biology as a catalyst for antimalarial drug discovery**

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Malaria remains a parasitic disease that has thwarted multiple efforts aimed at its elimination, and still causes major morbidity and mortality in Africa. Today, this is even more evident in light of emerging disease driven pandemics threatening the gains against age-old sources like malaria. Although challenges to the elimination of the disease is multifaceted, renewed focus on the causative agent, *Plasmodium falciparum*, is promising novel health innovations to prevent pathology whilst simultaneously curbing its spread. However, any new intervention strategy needs to consider the variant biology associated with each stage of the parasite's development. This includes processes associated with cell growth and replication during the parasite's asexual proliferation phase as well as cellular differentiation and maturation during sexual development, all encompassed in the host intraerythrocytic environment. We use a systems biology approach to provide high-resolution descriptors of the parasites epigenome, transcriptome and proteome associated with stage transition during the above phases. This revealed stage-stratified Achilles's heels to indicate novel druggable processes in the parasite, which have led to the development of epidrugs and resistance-resistant compounds displaying polypharmacology. With the added advantage of specifically targeting parasite transmission, these are exciting new leads that can play a role in malaria elimination strategies.