

Title: Dissecting the Coordination of Schizogony in *Plasmodium falciparum*
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Malaria remains a major global health burden, causing over half a million deaths each year. Disease pathology arises during the asexual blood stage, when parasites proliferate through schizogony, an unusual mode of cell division that drives rapid expansion in the bloodstream. During this process, repeated rounds of DNA replication and nuclear division occur within a shared cytoplasm, generating multiple daughter nuclei before a final specialised cytokinesis event, termed segmentation, produces invasive merozoites. These nuclear cycles proceed asynchronously, so that nuclei at different cell-cycle stages coexist within a single parasite. Despite its central importance, the coordination of DNA replication, mitosis, and segmentation during schizogony remains poorly understood. The parasite employs a mode of cell division that differs markedly from that of its human host, and many conventional cell-cycle regulators are either absent or highly divergent. How nuclear cycles are organised within a shared cytoplasm, and how their timing and progression are controlled, therefore remain fundamental unanswered questions.

This project aims to define how these processes are coordinated during schizogony and to identify regulatory factors that govern nuclear replication and division. We will first establish cell cycle sensor lines to monitor DNA replication and mitotic progression in blood-stage *Plasmodium falciparum*, the most lethal human malaria parasite. We will then use inducible genetic perturbation to screen candidate regulatory molecules and transcription factors for essential roles in schizogony, followed by detailed functional analysis of prioritised factors to determine how they regulate nuclear cycle progression. Together, this work will advance understanding of *Plasmodium* proliferation and may identify vulnerabilities exploitable for future intervention.