The LSHTM Human Malaria Transmission Facility: an open facility for experimental transmission studies of *Plasmodium* parasites

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Established in December 2020 at the London School of Hygiene & Tropical Medicine (LSHTM) with support from a Wellcome Trust Biomedical Resources grant, the Human Malaria Transmission Facility provides research groups worldwide with access to *Anopheles* spp. mosquitoes infected with human malaria parasites. With a strong track record of successful experiments, the facility specialises in studies of *Plasmodium* transmission, working closely with collaborators to design and execute research across the malaria transmission cycle. Insectary-reared *Anopheles* mosquitoes are fed *Plasmodium* spp. gametocytes - grown *in vitro* or obtained from clinical samples provided by the UKHSA Malaria Reference Laboratory - via artificial membrane feeding. A variety of experimental endpoints can be assessed, including ookinete imaging, oocyst prevalence and intensity in mosquito midguts, sporozoite presence in salivary glands, and oocyst genotyping. The facility supports a wide array of studies, including: investigations into the transmission potential of transgenic *P. falciparum* lines; exploration of the relationship between mosquito microbiome and malaria transmission; xenomonitoring of parasite prevalence in vector and non-vector blood-feeding insects; studies on the impact of parasite drug resistance on fitness for mosquito infection; evaluation of how drugs, insecticides and endectocides affect sporogony. We have successfully infected mosquitoes with clinical isolates exhibiting varying anti-malarial resistance phenotypes. These experiments offer valuable insight into the effects of drug resistance and demonstrate that various *P. falciparum* strains, of different origins, can be transmitted to mosquitoes within our facility. We will present selected results from collaborative studies with both UK-based and international partners.

Keywords: Malaria transmission, *Plasmodium falciparum*, *Anopheles* mosquitoes, oocyst, sporozoites