Malaria reactions and compare the impact of the

Malaria is stilla public health burden, particularly inSub Saharan Africa.

In 2017, 216million malaria cases and 445, 000 deaths were reported. There has been a decline in malaria over thelast decade due to combined efforts of curbing the disease. However, malaria isstill prevalent with occasional outbreaks in endemic regions. The female Anopheles mosquito is the main vector transmittingthe protozoan parasite Plasmodiumfalciparum that causes the most lethal form of human malaria. Recently, amicrosporidian symbiont containing a robust malaria transmission blockingphenotype was discovered in the Anophelesgambiae. This provides a viablealternative avenue of controlling malaria transmission especially now wheninsecticide resistance is rampant.

The success of this strategy heavy relies on the determination of optimal microsporidiapropagation in the vector, transferbetween infected and uninfected mosquitoes and effective malaria transmissionblockage. These factors are yet to be studied. Here, we will investigate these four factors. Mosquitoes will be reared under different conditions with subjection tovarious parameters including blood meal versus plasma – ATP combinations, light: dark exposures and temperature disparities. Larvae from microsporidiainfected mosquitoes will be fed to uninfected screen house mosquitoes to testthe differences in horizontal and vertical transmission. Dissection of adultmosquitoes under a scanning electron microscope will be conducted to validatethe transfer of the microsporidia spores across mosquitoes. Real-time PCR followed by sequencing will beused to determine the similarities of the microsporidia species using conservedsequences. Metabolic pathways of the vector will be analysed by validating theactivity of

essential enzymatic reactions and comparethe impact of the presence of microsporidia on the metabolism of the infected against uninfected mosquitoes.

Ultimately, this study is expected to yieldmosquito populations with reduced survival in terms of fecundity and maturationto adult stage thus eliminating the malariavector before they acquire the capacityto take up and transmit P. falciparum. The data emanating from this study will alsogive insights on the viability of microsporidia as a malaria transmission blocker inSub Saharan Africa.