Putting malaria on the SHELPH

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Experts have disabled a unique member of the signalling proteins which are essential for the development of the malaria parasite. They have produced a mutant lacking the ancient bacterial Shewanella-like protein phosphatase known as SHLP1 (pronounced shelph). This mutant is unable to complete its complex life cycle and is arrested in its development in the mosquito. The discovery could help in the design of new drugs to arrest the spread of this killer disease.

SHLP1is critical to the cellular development of the malaria parasite. It can be found at every stage in the lifecycle of the malaria parasite and for the first time experts led by The University of Nottingham have analysed their biological function.

Dr Rita Tewari and her team in the Centre for Genetics and Genomics in the School of Biology have spent three years studying the phosphatase proteins that are important building blocks in the life cycle of the malaria parasite. The findings of their latest study are published today, 21 February 2013, in the academic journal *Cell Reports*.

Dr Tewari said: "SHLP1 is absent in humans and can be explored as an excellent target for malaria transmission control. Prevention of malaria transmission to and from the mosquito is vital in order to stop the devastating spread of malaria. Targeting SHLP1 could be an important step to achieve this goal."

Although great strides have been made in reducing the number of deaths from malaria, half the world's population remains at risk from the

disease. In 2010 90 per cent of all malaria deaths occurred in Africa—mostly among children under the age of five.

Dr Tewari's latest research has focused on the ancient bacterial Shewanella-like protein phosphatase (SHLP1) which is found only in bacteria, fungi, protists (organisms which paved the way for the evolution of early plants, animals and fungi) and plants.

The researchers, funded by the MRC and the Wellcome Trust, have discovered how SHLP1 controls development of the parasite at an essential stage of its life cycle. The parasite must move between human and mosquito in its quest to spread the disease. It does this every time the mosquito bites. Removing this enzyme causes defects in structures vital for invading the mosquito gut—effectively stopping the mosquito from passing the disease on to another victim.

Provided by University of Nottingham