

Lifting malaria's deadly veil: mystery solved in quest for vaccine

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(Medical Xpress) -- Researchers at the Burnet Institute have made a major breakthrough in the quest for a vaccine against malaria, which causes up to one million deaths each year.

Published in the [Journal of Clinical Investigation](#), this research reveals a key target of the [immune system](#)'s attack against malaria. The findings show that people who are immune to malaria develop antibodies that primarily target a protein known as PfEMP1, which is produced by *Plasmodium falciparum*, the causative organism of most cases of malaria.

Head of Burnet's Centre for Immunology and senior author of the study, Professor James Beeson, said that these findings are a major advance towards developing an effective [vaccine](#) because they unlock the

mystery of which malaria proteins, known as variant surface antigens (VSAs), an effective vaccine could target to achieve immunity to malaria.

“The new findings support the idea that a vaccine could be developed that stimulates the immune system so that it specifically mounts a strong response (or attack) against the PfEMP1 protein that malaria produces,” Professor Beeson said.

“A vaccine against malaria is urgently needed to reduce this disease globally and currently there is no licensed malaria vaccine available.”

Co-first author, Jo-Anne Chan said the study also showed that when the immune system attacks other proteins that malaria produces, this is not as effective in protecting people. This emphasises that the immune system has to ‘get it right’ in order to fight malaria infection effectively.

“Our studies of Kenyan children showed that those with antibodies to the PfEMP1 protein had a significantly reduced risk of developing malaria, whereas antibodies to other surface antigens were not associated with protective immunity” she said.

Malaria is caused by a parasite that infects human red [blood cells](#) and replicates within them. While inside these cells, the malaria parasites produce specific proteins that enable infected cells to stick and clog-up blood vessels in the body. This clogging can occur in organs such as the brain and lungs, and the placenta in pregnant women, and causes severe illness and death.

People who recover from malaria develop antibodies that coat the [malaria](#)-infected red blood cells so that they are destroyed by white blood cells (the body’s killer immune cells). The new studies show that the PfEMP1 protein is the major target of these protective antibodies.

More information: ‘Targets of antibodies against Plasmodium falciparum–infected erythrocytes in malaria immunity’. *Journal of Clinical Investigation*, 2012

Provided by Burnet Institute

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