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Burnet Institute and WEHI in Australia unveil immune blueprint for nextÃ¢â?¬Â• generation malaria vaccines

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A major obstacle to developing a P. vivax vaccine has been limited understanding of what protective immunity actually looks like



New research co-led by Burnet Institute and Walter and Eliza Hall Institute of Medical Research (WEHI) in Australia has uncovered how the human immune system fights *Plasmodium vivax*, paving the way for the first effective vaccine against the most widespread form of malaria.

Published in *Immunity*, the study provides critical evidence of how protective immunity to *P. vivax* works, identifying specific targets on the parasite and explaining how antibodies function to prevent and clear infection.

Burnet Senior Research Fellow Dr Herbert Opi said progress in global malaria control efforts has stalled despite decades of progress.

“While two malaria vaccines have been rolled out in parts of Africa, both target *Plasmodium falciparum* and offer no protection against *P. vivax*, which dominates in Asia and the Pacific,” he said.

A major obstacle to developing a *P. vivax* vaccine has been limited understanding of what protective immunity actually looks like. Professor James Beeson, Head of Malaria Immunity and Vaccines at Burnet, said the findings provide critical evidence to guide vaccine design.

WEHI Laboratory Head Dr Rhea Longley said global malaria research and vaccine investment has overwhelmingly focused on *P. falciparum*, leaving major knowledge gaps for *P. vivax*.

Using blood samples from children in Papua New Guinea – a region heavily affected by *P. vivax* – researchers examined how antibodies interact with the immune system to prevent disease. The findings show that protection from *P. vivax* is not driven by the presence of antibodies, but by how those antibodies function and which parasite proteins they target.

Researchers identified antibody responses that recruit immune cells and activate immune pathways to attack the parasite. The immune system response was significantly stronger when it targeted multiple proteins at once.

Targeting the right combination of proteins was crucial and could reduce malaria risk by more than 75% – a finding that provides a clear strategy for future vaccine development. The study involved a collaborative partnership between Burnet, WEHI, PNG Institute of Medical Research, and Ehime University Japan.