

# Discovery of key molecules involved in severe malaria – new target for malaria vaccine

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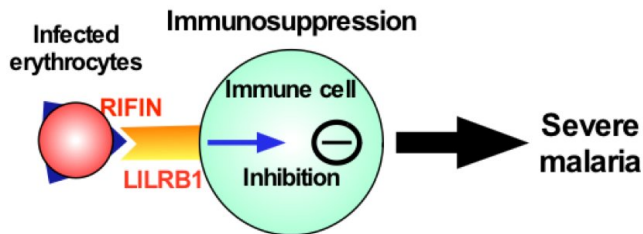


Fig.1. Mechanism of immune escape by *P. falciparum*. *P. falciparum* induces the expression of RIFINs on the surface of infected erythrocytes. RIFINs target host inhibitory receptor LILRB1, thus facilitating escape from host immune system by inhibition of the immune response, which leads to severe malaria. Credit: Osaka University

Malaria is one of three major infectious diseases affecting approximately 300 million people every year, accounting for about 500,000 deaths, but effective vaccine development has not been successful. Among malaria parasites infecting humans, *Plasmodium falciparum* (*P. falciparum*) causes especially severe disease. In addition, acquired immunity to malaria is inefficient, even after repeated exposures to *P. falciparum*, but the immune regulatory mechanisms used by *P. falciparum* remain largely unclear. Therefore, malaria parasites appear to have a mechanism to escape our immune system.

A research group led by Fumiji Saito, Kouyuki Hirayasu, Hisashi Arase at Osaka University found that proteins called RIFIN expressed on erythrocytes infected with *P. falciparum* help the parasite to suppress the host immune response, causing severe [malaria](#) (Fig. 1). These findings are expected to contribute to the development of effective vaccines and therapeutic drugs against

malaria.

Malaria parasites infect mainly erythrocytes in the host and proliferate within infected erythrocytes. The team found that proteins called RIFIN expressed on *P. falciparum*-infected erythrocytes bind to a host inhibitory receptor LILRB1. Furthermore, RIFIN suppresses the immune response to malaria, resulting in severe complications of malaria.

This research disclosed for the first time in the world that *P. falciparum* has a new mechanism to suppress the host immune response by using an inhibitory receptor, contributing to the pathogenesis of severe malaria. The results of this research are expected to greatly contribute to the development of therapeutic drug and vaccine against malaria.

**More information:** Fumiji Saito et al. Immune evasion of *Plasmodium falciparum* by RIFIN via inhibitory receptors, *Nature* (2017). [DOI: 10.1038/nature24994](https://doi.org/10.1038/nature24994)

Provided by Osaka University

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