

MALARIAL VACCINES

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One of the greatest challenges of medicine has been the development of an effective and safe vaccine against malaria.

Despite the persistent efforts and spending hundreds of millions of dollars and lifelong sacrifice from dedicated physicians and scientists for over a century, the malaria vaccine has remained elusive.

Development of a vaccine for malaria has turned out to be a highly complex exercise owing to a multitude of difficulties. A natural malaria infection does not induce much immune protection- after repeated and prolonged exposure to malaria parasite over several years, only partially effective immunity is acquired, which is short-lived and is highly stage- and strain-specific. This immunity is unable to eradicate all parasites nor does it provide complete protection against future challenge. Instead, it only results in a mild, sometimes asymptomatic infection with the persistence of parasites.

This kind of a partial immune response is due to - the complex biology of the *Plasmodium* parasite, its extensive antigenic diversity, and its immune evasion strategies. All these factors make vaccine development against malaria challenging.

Several vaccine candidates have been tested over the years, but without much success. As many as 80 malaria vaccine candidates are at the preclinical development stage, out of which more than 30 have entered clinical testing and at least 3 have gone as far as Phase IIb trials or beyond. In India, the Malaria Group at the International Center for Genetic Engineering & Biotechnology (ICGEB), New Delhi, has undertaken efforts to develop vaccines for both *P. vivax* and *P. falciparum* malaria.