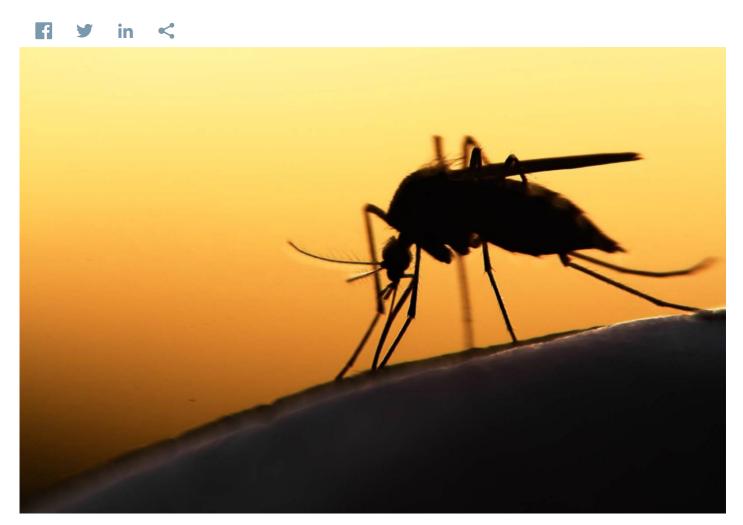# Transgenic Mosquito May Help Fight The Spread Of Malaria

Johns Hopkins University

According to the World Health Organization, malaria infects up to 500 million people every year and causes more than 1 million deaths. Despite efforts by the research community, malaria continues to plague much of the world because of the genetic complexity and multiple distinct life-cycle stages of the Plasmodium falciparum parasite, which carries the disease.

For decades, scientists in laboratories around the world have worked steadily toward creating genetically modified (transgenic) species. In the late 1990s the first transgenic mosquito was developed. Researchers at the Johns Hopkins Malaria Research Institute, with financial support from the National Institutes of Health, have now proven that mosquitoes can be genetically modified so they cannot support the deadly parasite.

Unlike other diseases, humans cannot spread malaria through direct contact. The parasite must first complete its cycle within a mosquito and be transmitted through a mosquito sting. Led by Marcelo Jacobs-Lorena, Ph.D., a professor at Johns Hopkins School of Public Health, researchers have identified a glyco in the mosquito's genetic makeup that the

parasite must have in order to fully develop.

> ❝ *If access to that protein is blocked, the parasite dies.*

This important discovery may result in a future vaccine that uses antibodies that block the production of this key sugar in the mosquito. Thus if a mosquito feeds on a vaccinated human, it would ingest the antibody, which would ultimately kill the parasite.

Studies by Jacobs-Lorena and his team have also demonstrated transgenic mosquitoes are just as fit and durable as normal mosquitoes. This improves the chances of possibly interbreeding transgenic mosquitoes with normal mosquitoes in the wild.

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