

# Researchers create mosquitoes incapable of transmitting malaria

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Mosquitoes bred to be unable to infect people with the malaria parasite are an attractive approach to helping curb one of the world's most pressing public health issues, according to UC Irvine scientists.

Anthony James and colleagues from UCI and the Pasteur Institute in Paris have produced a model of the [Anopheles stephensi](#) mosquito – a major source of malaria in India and the Middle East – that impairs the development of the [malaria parasite](#). These mosquitoes, in turn, cannot transmit the disease through their bites.

"Our group has made significant advances with the creation of transgenic mosquitoes," said James, a UCI Distinguished Professor of microbiology & molecular genetics and molecular biology & biochemistry. "But this is the first model of a malaria vector with a genetic modification that can potentially exist in wild populations and be transferred through generations without affecting their fitness."

More than 40 percent of the world's population lives in areas where there is a risk of contracting malaria. According to the Centers for Disease Control & Prevention, 300 million to 500 million cases of malaria occur each year, and nearly 1 million people die of the disease annually – largely infants, young children and pregnant women, most of them in Africa.

James said one advantage of his group's method is that it can be applied to the dozens of different mosquito types that harbor and transmit the

*Plasmodium falciparum* parasite, including those in Africa. Study results appear this week in the early online version of the *Proceedings of the National Academy of Sciences*.

The researchers conceived their approach through mouse studies. Mice infected with the human form of malaria create antibodies that kill the parasite. James' team exploited the molecular components of this mouse immune-system response and engineered genes that could produce the same response in mosquitoes. In their model, antibodies are released in genetically modified mosquitoes that render the parasite harmless to others.

"We see a complete deletion of the infectious version of the malaria parasite," said James, a member of the National Academy of Sciences. "This blocking process within the insect that carries malaria can help significantly reduce human sickness and death."

He and his colleagues have pioneered the creation of genetically altered [mosquitoes](#) that limit the transmission of dengue fever, [malaria](#) and other vector-borne illnesses.

Provided by University of California, Irvine

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