Scientists Use Mosquitoes to Vaccinate Humans With Experimental Malaria Vaccine

Scientists developing a new experimental malaria vaccine are using a box full of mosquitoes to vaccinate people, according to a research paper published in Science Translational Medicine. In the clinical trial, the vaccine was administered three or five times by 200 infected mosquito bites per immunization.

During the clinical trial, the mosquitos delivered genetically modified, malaria-causing Plasmodium parasites that allegedly prevent subjects from being infected. The body then produces antibodies against the weakened parasite so it's ready to fight the disease.

"We use the mosquitoes like they're 1,000 small flying syringes," Dr. Sean Murphy, a University of Washington physician wrote.

Trial participants put their arms over a box that looked like

“a Chinese food takeout container” and let themselves get bit by at least 200 mosquitoes inside leaving their arms swollen and blistered.

The researchers used mosquitoes instead of needles because it is expensive and time-consuming to use needles to deliver a parasite during the proof-of-concept stage of the trial.

Malaria is a disease caused by a parasite that generally infects a certain type of mosquito which feeds on humans. Although malaria can be fatal, it can usually be prevented. There are only 2,000 cases of malaria diagnosed in the U.S. each year, most of which are from travelers.

To test whether the vaccine worked, participants received a second round of mosquito bites containing the real malaria parasite. Out of 14 trial participants exposed to malaria, seven of them developed the disease – meaning the vaccine was only 50% effective. For the other seven participants, protection didn’t last more than a few months.

Researchers involved in the study plan to improve vaccine efficacy by using actual syringes instead of mosquitoes and by altering the dosage.

The first malaria vaccine was developed by GlaxoSmithKline and approved by the World Health Organization in 2021 to be used in Africa, despite the fact it only showed an efficacy rate of 30% to 40%.

The researchers hope to improve poor vaccine efficacy numbers by using syringes instead of mosquitoes next time, which will allow them to “get the dosage right.”