

Genetically engineered vaccine prevents malaria in mice

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A genetically engineered malaria vaccine has been shown to prevent the disease in mice, researchers say. The findings offer hope of halting the illness in humans, as well as stopping transmission of the mosquito-borne disease.



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Researchers at the Centre for Infectious Disease Research (CIDR) at the University of Washington in Seattle, in conjunction with the Fred Hutchison Cancer Research Centre, have developed a vaccine that uses the entire malaria-causing parasite — called *P. falciparum* — to stimulate a protective immune response.

Three genes

The vaccine weakens the malaria parasite by knocking out three genes that the organism needs in order to replicate in the human liver and re-emerge in the bloodstream to cause illness.

"[Removing] these three genes make sure the parasite cannot develop to the next stage of infection, which occurs in the blood, which causes all of the disease and death associated with malaria," said CIDR's Stefan Kappe, one of the main authors of the study, published Wednesday in the journal *Science Translational Medicine*.

Normally, after the parasite infects the liver, it leaves the organ to infect red blood cells, where billions of disease-causing parasites are produced.

In the study, researchers identified the three genes tucked within the parasite's enormous genome that allow it to enter the bloodstream. By knocking out those genes, says Kappe, the altered parasite remained confined to the liver and the immune system began churning out protective antibodies.

Clinical trials

"So, it infects the liver — that is asymptomatic so that's OK, and it doesn't cause any specific damage to the liver — but it stimulates your immune system [to fight]," Kappe said. "So, [the parasite] stops right there, and we call it 'check in, but it doesn't check out'."

In a Phase 1 clinical trial testing the vaccine's safety, the neutralised parasite was injected into 10 healthy human volunteers, where it stimulated a strong immune response without causing malaria.

Investigators then injected mice with the vaccine containing genetically engineered parasites, and exposed those mice to whole parasites that had not been altered. The vaccine completely protected the animals from malaria, according to researchers.

Source: allAfrica

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