

Exploring gene drive's role in fight against malaria

An international initiative has formed to ensure that gene drive technology gets a chance to prove its mettle in the quest to control malaria.

The [GeneConvene Global Collaborative](#), which operates under the auspices of the [Foundation for the National Institutes of Health](#) (FNIH), will focus initially on advancing the safe, ethical and rigorous exploration of gene drive approaches in preventing malaria, which killed more than 400,000 people — most of them children under the age of 5 — and sickened another 225 million in 2018 alone.

Various efforts are [already under way](#) to research and [test](#) the use of gene drives to limit the reproduction of mosquitoes, which transmit malaria and other diseases. Though the emerging technology is seen as a cost-effective and “green” alternative to insecticides, and also could be used to control agricultural pests that cause crop losses and invasive species that disrupt native ecosystems, it has met with resistance from some environmentalists and ethicists. They worry about the impacts of greatly suppressing or eliminating entire species, even those that cause harm.

These concerns have prompted [calls for a moratorium](#) on gene drive releases, which have been countered by [statements supporting](#) continued research. The issue has assumed new urgency as progress against malaria has slowed due to factors such as increasing resistance of mosquitoes to insecticides, prompting expert bodies to call for research into new tools.

GeneConvene is stepping into this confusing and contentious arena to “enable informed and rigorous decision making on research and potential use of genetic biocontrol approaches for public health,” said Michael Santos, FNIH associate vice president of science.



Mosquito nets and insecticides have limited effectiveness in preventing malaria.
Credit: Shutterstock

“The importance of continued exploration of gene drive approaches for malaria prevention has been recognized by governments and organizations across the world, including the World Health Organization and the African Union,” Santos said. “Governments and other public stakeholders are responsible for deciding if and how gene drive technologies are researched, developed and used. GeneConvene works to educate stakeholders about these technologies and ensure they have the information they need to make those decisions.”

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“Genetic technologies such as gene drive hold great promise, and as an emerging area of science, they require a rigorous approach,” said Willy Tonui, GeneConvene partner and former CEO of Kenya’s National Biosafety Authority. “GeneConvene will help ensure that genetic biocontrol technologies are explored collaboratively with the involvement of stakeholders around the world.”

Santos said GeneConvene’s role is to identify emerging issues around gene drives and ensure that research is conducted in a safe, ethical and rigorous way.

“Critical thinking and consensus building about the pathway for development are crucial,” Santos said. “That is what led us to begin working with global experts to identify and respond to needs in areas such as biosafety, ethics, engagement and governance.”

GeneConvene will bring these experts together to “synthesize the perspectives into best-practice recommendations” for consideration by those who develop regulatory and policy frameworks, he explained.

“For example, in Africa, where more than 90 percent of malaria deaths occur, the African Union Development Agency (AUDA-NEPAD) supports member states and regional economic communities to develop regulatory capacity and policies for gene drive approaches for malaria,” Santos said. “GeneConvene assists those efforts by providing technical assistance on gene drive science and biosafety capacity strengthening.”

GeneConvene is also dedicated to disseminating accurate information about gene drives. To that end, it created the [GeneConvene Virtual Institute](#), which consolidates research and other accurate information about the technology into a central online site. The Institute currently offers a robust FAQ section, as well as multimedia resources that address the various types of gene drives and their possible applications in health, agriculture and conservation; how a gene drive mosquito is made; ethical issues; and biosafety, regulation and policy topics.

Santos said GeneConvene is a natural extension of FNIH, which has been working in the field of gene drive research and related regulation for more than a decade. FNIH was also one of the original partner organizations in the Grand Challenges in Global Health initiative, managing projects seeking to develop new biological strategies for controlling disease-transmitting insects.

The initiative has received initial funding from the Bill & Melinda Gates Foundation, which is also a major funder of the Cornell Alliance for Science, Open Philanthropy and Wellcome Trust.

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