How to prevent a ‘mistake’ with release of gene-edited mosquitoes? On-off switches

So, you’ve genetically engineered a malaria-resistant mosquito, now what? How many mosquitos would you need to replace the disease-carrying wild type? What is the most effective distribution pattern? How could you stop a premature release of the engineered mosquitos?

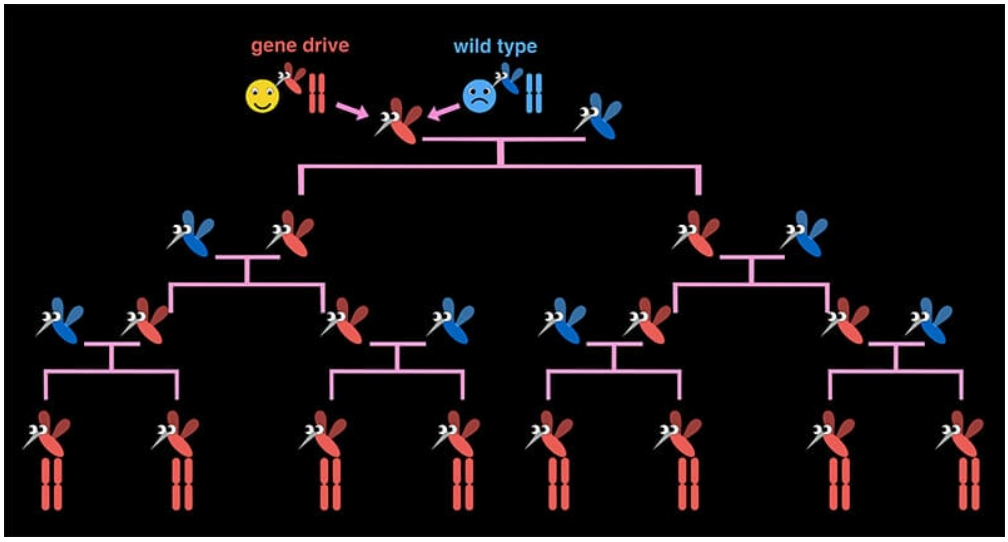
Releasing genetically engineered organisms into an environment without knowing the answers to these questions could cause irreversible damage to the ecosystem. But how do you answer these questions without field experiments?

In the normal course of evolution, any specific trait has only a modest chance of being inherited by offspring. But, with the development of the CRISPR-Cas9 gene editing system, researchers can now design systems that increase the likelihood of inheritance of a desired trait to nearly 100 percent, even if that trait confers a selective disadvantage. These so-called gene drives could replace wild-type genes in short generations.

…

“We can, in effect, construct switches that initiate and terminate the gene drive wave,” said Hidenori Tanaka, first author of the paper…. “In one, carefully chosen regime, the spatial spreading of the wave starts or progresses only when the parameters of the inoculation exceed critical values that we can calculate.”

[Read the full study here]



The GLP aggregated and excerpted this blog/article to reflect the diversity of news, opinion, and analysis. Read full, original post: Safely releasing genetically modified genes into the wild