

CRISPR offers hope for controlling African swine fever

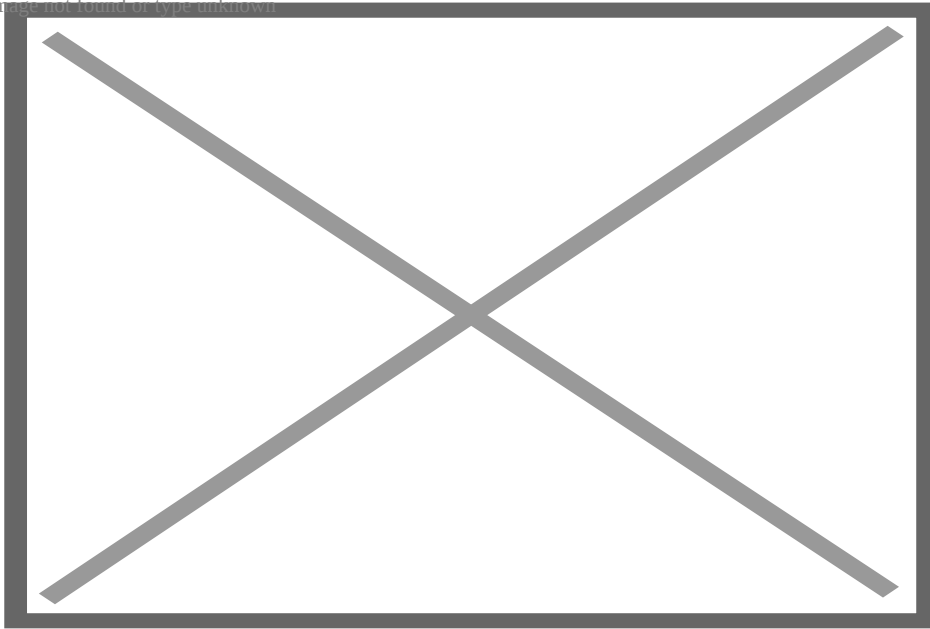
N

ew vaccine trials hold great promise in the management of an East African strain of African swine fever (ASF), one of the most devastating diseases to afflict pigs.

Scientists at the [International Livestock Research Institute](#) (ILRI) are employing CRISPR Cas9 editing and synthetic biology to modify the ASFV genome in order to attenuate the virus for a live vaccine to help reduce deaths from African swine fever. Up to 10 vaccine candidates have been lined up for tests, in a project that commenced in 2016.

“This is the first test based on a genome to be conducted on genotype IX, which is prevalent in Eastern and Central Africa,” Lucilla Steinaa, leading scientist in the vaccine research against African swine fever at ILRI, told the Alliance. The genetic characterization of all the ASF virus isolates known so far has demonstrated 23 geographically related genotypes with numerous subgroups, according to the Food and Agriculture Organization (FAO).

Image not found or type unknown



Lucilla Steinaa. Credit: ILVAC

“There are seven to 10 candidates, on a variety of stages,” Steinaa said. “We have just started the lab experiment, a controlled animal experiment, which I estimate may run until the end of 2022 or thereabouts. By then, we hope to have found a candidate vaccine that can be produced.”

ASF is present in 26 African countries, Steinaa observed, as well as in parts of Asia and Europe. An effective vaccine could be a breakthrough for pig farmers across the globe.

“The only reason it’s not yet a catastrophe here is that the pig production is not one of the biggest commodities in Africa,” Steinaa said. “But it’s coming on — fast. Africa is doing a lot more pig rearing year

by year. It would be a disaster if they had a big production like, say, Europe.”

With 400 million pigs, China has the largest share of the world’s total population of 770 million pigs. With a 100 percent fatality rate and a highly contagious nature, ASF poses a potent threat to the global pig farming industry. The rapid spread of the disease portends social and economic disruptions wherever it strikes.

In Europe and Asia, the disease is also found in wild boars.



Credit: Taviphoto

Smallholder farmers are particularly vulnerable to the devastation wrought by the disease, which has seen many of them shun pig farming.

“Right now, it is very difficult for the smallholder farmers because of ASF. If they encounter ASF they are discouraged from starting again, because it eradicates the whole herd. A vaccine would obviously prevent that. If it can be availed at a price that is affordable, then this would be the easiest way to maintain production,” Steinaa said.

Follow the latest news and policy debates on sustainable agriculture, biomedicine, and other ‘disruptive’ innovations. Subscribe to our newsletter.

[SIGN UP](#)

Successes in the ongoing vaccine trials on genotype IX will provide valuable lessons in the race for a comprehensive cure for the ASF, a disease that has wreaked havoc in many parts of the globe since its discovery in Kenya about a century ago.

Steinaa added that scientists are also trying to attenuate *Theileria parva*, the protozoan parasite that causes East Coast fever, using the same technique that has been used for ASF.

Dr. Joseph Maina is a Senior Lecturer in the Department of Earth and Environmental Sciences at Macquarie University. Joseph’s ultimate goals are to understand and predict the impacts of environmental variability and change on social and ecological systems at local and global scales

to support spatial planning & management.

A version of this article was originally posted at the [Cornell Alliance for Science](#) and has been reposted here with permission. The Cornell Alliance for Science can be found on Twitter [@ScienceAlly](#)