



Healthy wildlife, healthy people

Using blood fed mosquitoes to prevent epidemics

Natural pandemics represent a huge risk to our world's population. Globalization, population growth and climate change all contribute to a sharp increase in infectious diseases, and that requires effective solutions and early detection.

Currently there is no method to detect disease outbreaks at an early stage. That means that action is only taken when a significant number of people have already caught the disease and an epidemic is well underway. The previous Ebola outbreak already killed thousands of chimpanzees before arriving in humans. We have found a possible way to detect outbreaks like Ebola and Zika, even before they are transmitted to humans.

What will we do?

Wageningen researcher Dr. Niels Verhulst and his team will use blood fed mosquitoes to monitor pathogens in wildlife. Such mosquitoes are likely to have ingested disease agents along with the blood, and this is therefore a good blood-collection method to detect outbreaks of pathogens in wildlife that could be a danger for humans and nature.

First, the mosquitoes are caught in traps with a specific odor blend. Wageningen University & Research (WUR) has already proven that this odor blend attracts blood fed mosquitoes, and it will now further develop these traps. Next, the mosquitoes will be monitored with an easy-to-use and inexpensive device that has a nanosensor in it. The nanosensor can detect both the blood of a pathogen's bearer – the monkey or the bird – and the pathogen itself. WUR has already made a working prototype and will further develop such a device for this goal. In the meantime, the team will combine expertise in vector ecology, virology, bio-nanotechnology and sociology to develop a risk assessment kit. This kit can be used to monitor known pathogens and determine hotspots and transmission routes during outbreaks of novel diseases. The World Health Organization (WHO) and

local health institutes will be able to use this kit to respond quickly and prevent large outbreaks.

Who will benefit?

Semi-field experiments in screen-walled greenhouses will be followed by field experiments in the Rift Valley in Kenya. Here, the team will first validate the tools and implement the risk assessment kit. The local population will benefit immediately, as they will get a rapid insight into local health threats. Globally people will benefit from the prevention of pandemics. Because the kit will be the first tool that permits the detection of infectious pathogens before an outbreak, wildlife in nature reserves will benefit too.

What we need to make it happen

Wageningen University & Research will collaborate with Kenyan partners for the field studies, with Biogents AG in Germany for the production of mosquito traps, and with medical scientists from University of Pennsylvania, USA, for the detection of pathogens in wildlife. Three PhD students will work on the project, and local staff in Kenya will be trained. We will also stimulate entrepreneurship. The project will take 5 years, and will cost 2 million euro.

You can make a difference

The project provides the opportunity to contribute to saving lives of people and wildlife. If you or someone you know are interested in donating to or investing in this project, please contact project leader Niels Verhulst or Fanny Castel of University Fund Wageningen.

University Fund Wageningen can send your company an invoice so that your gift becomes tax deductible. Alternatively, you can send your contribution through the American Friends of WUR at the King Baudouin Foundation United States (KBFUS). More information on how to donate can be found at: www.universityfundwageningen.eu/howtodonate.



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