Prix National Jeunes Chercheurs

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Abstract

The ongoing epidemic of Ebola virus disease (EVD) in the Democratic Republic of Congo (DRC), in the North Kivu and Ituri provinces, is the tenth and the largest EVD outbreak in the country since the discovery of the virus in 1976. Since July 2018, a total of 2312 cases have been diagnosed, including 1559 deaths. The situation is getting worse due to regular attacks by armed groups targeting the population and the outbreak response teams, and to the population's distrust of vaccine and treatments.
Thus, it becomes even more necessary to understand the origin of Ebola virus, to further prevent such sanitary crisis. Wildlife, especially bats, is suspected to be the reservoir of the virus. But so far, nothing is known about Ebola virus circulation in wildlife in the outbreak zone. This study aims to bring more data about the potential circulation of the virus in bats living close to human populations in this area.
A total of 461 bats from 9 different insectivorous and frugivorous species, were captured, oral and rectal swabs and dried blood spots were sampled. Samples are tested for the presence of filoviruses by RT nested PCR using the Reverse Transcription System and GoTaq® Hot Start Master Mix Promega kits and degenerated primers able to detect a large range of filoviruses. Amplicons are purified using the ProNex® Size-Selective Purification System (Promega), and are sequenced using the MinIon from Oxford Nanopore Technologies.
This innovative high throughput and pocket size device sequencing technique, has been chosen to face the lack of Sanger sequencing equipment in the Ebola reference lab in the country.
We are currently implementing this technique in our lab partner, the National Institute for Biomedical Research in Kinshasa, DRC. To date, a total of 295 bats have been tested, and 5 suspected amplicons are about to be sequenced. Phylogenetic relationships between the sequences and known filoviruses will be further analyzed using a self-developed bioinformatic tool (NanoFlow). This project is currently under deployment, but we show the capacity of our innovative technique to address a crucial public health issues, in real time and a particularly challenging environment