Ebola Foresight: the Role of Livestock and Wildlife Species in the Biology of Filoviruses

Kerstin Fischer1, Juliet Jabaty2, Alimou Camara1, Sandra Diederich1, Thomas Hoenen4, Anne Balkema-Busmann1, Andreas Müller1, Roland Suluku1, Kristina M. Schmidt1, Cécile Troupin1, Bashiru Koroma5, Felixtina Jonsyn-Ellis2, Noël Tordo1, Thomas C. Mettenleiter1, Martin H. Groschup1

1Friedrich-Loeffler-Institut, Institute of Novel and Emerging Infectious Diseases, Germany
2Sierra Leone Agricultural Research Institute (SLARI), Freetown, Sierra Leone
3Institut Pasteur Conakry, Guinea and Paris, France
4Friedrich-Loeffler-Institut, Institute of Molecular Virology and Cell Biology, Germany
5Njala University, Freetown, Sierra Leone

Summary

Filoviruses, which encompass both Ebola- and Marburgviruses, are zoonotic pathogens responsible for severe hemorrhagic fever in humans. While it was until recently assumed that human pathogenic filoviruses are limited to Central Africa, the unprecedented Ebola outbreak in West Africa 2013-15 made the international community unequivocally aware that filoviruses are in fact more widely distributed than previously thought. Bat species have been identified as natural reservoir hosts for both Ebola- and Marburgviruses. However, to what extent other animal species are involved in the transmission cycle to humans or serve as additional hosts for filoviruses is largely unknown. The aims of this project are, in a close cooperation between the Friedrich-Loeffler-Institut (FLI), the Institut Pasteur in Guinea (IPG), as well as the Njala University (NU) and the Sierra Leonean Agricultural Research Institute (SLARI), to build capacity in the West African partner laboratories as well as to investigate the role of livestock and wildlife species in the biology of filoviruses. Therefore, on-site workshops and training of laboratory staff in biosafety measures, animal sampling and diagnostic methods have taken place and will be continued throughout the project period. Further, modern diagnostic methods for the detection of filoviruses in humans and animals have been developed and will be established within the partner countries. This includes novel, easy-to-use sequencing technologies as well as serological assays. The studies will be enhanced by complementary and supportive work at FLI using the latest methods and the newly established maximum containment (BSL4) laboratory. Altogether, this project strengthens the research cooperation between Germany and the African partner countries, and paves the way for future joint research projects.