

Results report

1. Title of Research and Development : Surveillance of Viral Zoonoses in Africa
2. Principal Investigator : Ayato Takada (Research Center for Zoonosis Control, Hokkaido University, Professor)
3. Counterpart Principal investigator : Aaron Mweene (School of Veterinary Medicine, University of Zambia, Professor (Zambia))
4. Results of Research and Development:

[Aims and objectives]

In this project, we collect biological samples from wild animals, livestock, and humans for investigation of virus infections in Zambia, aiming at identification of the natural reservoirs and elucidation of the transmission routes and host ranges of zoonotic viruses. Attempts are also made to assess the risks of unknown or uncharacterized viruses as zoonotic pathogens. Through collaborative activities with the School of Veterinary Medicine of the University of Zambia, including the development of diagnostics and epidemiological field studies, we strengthen their research and education systems to nurture the human resources playing a pivotal role in the control of viral zoonoses in Zambia.

[Achievements]

We have set up all the experimental equipment necessary for research and educational activities of the project in the School of Veterinary Medicine of the University of Zambia and are operating the laboratory efficiently. Using animal isolator units provided to the laboratory, mouse breeding has been started. This has enabled us to immunize mice with viral antigens to produce monoclonal antibodies. In addition to this laboratory-based activity, efforts to collect biological samples from animals/humans and to detect zoonotic viruses were continuously made and these materials have been stored to be used as bioresources for future epidemiological research.

We have successfully detected filovirus- and bunyavirus-specific antibodies in the serum samples collected from wild and/or domestic animals, and discovered novel viruses from animals and arthropods (mumps-like bat paramyxovirus and new phlebovirus species, respectively) as well. These viral genes were sequenced and phylogenetically analyzed. Isolation of influenza A viruses from fecal samples from wild aquatic birds was also continuously carried out and the isolated strains have been added to our influenza virus library. We further developed a rapid diagnosis kit enabling us to detect ebolavirus antigens within ten minutes using ebolavirus-specific monoclonal antibodies, and confirmed its sensitivity and specificity for ebolavirus-infected monkey and human materials.

Joint Coordinating Committee and Scientific Meetings, consisting of Japanese researchers, their Zambian counterparts, the Japan International Cooperation Agency, Japan Agency for Medical Research and Development, and Zambian Ministries, were held to share information on the achievements and to discuss future activities under this project. Laboratory diagnosis of Ebola virus disease-suspected patients were also conducted (no positive case has yet been found in Zambia), contributing to public health efforts in Zambia. We also organized seminars and training courses to disseminate knowledge and diagnostic technology for the control of Ebola virus disease.