



# The Project for Surveillance of Viral Zoonosis in Africa

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Japan International Cooperation Agency  
ZAMBIA OFFICE



# Background

Recently, emerging and reemerging infectious diseases are appearing worldwide, and becoming of major concern to public health. Most of these diseases are zoonoses whose causative agents infect both humans and animals. Zoonoses are one of the highest priority issues for public health in Zambia and Southern African countries. As well as major human and animal infectious diseases including influenza, viral diseases such as haemorrhagic fevers that so far we do not have any control measures for, are also becoming of major public health concern in Zambia. Typically, the causative viruses are originally harmless in their natural host wild animals and occasionally transmit to other animal species including humans, causing infectious diseases. Despite all this, there is inadequate research, educational and administrative basis for the control of zoonoses, probably because it falls between the two sciences, human and veterinary medicine. In fact, there is a pressing need to develop effective measures for diagnosis, prophylaxis and therapy, to widely disseminate information and technology and to train experts for the control of zoonoses in Zambia and sub-Saharan Africa. Particularly, capacity building for research and diagnosis on viral diseases should be one of the most important subjects, so that Zambia can demonstrate leadership for the control of zoonoses in sub-Saharan Africa.

## Project Purpose

Encompassing research and surveillance capacity for viral zoonosis is strengthened in Zambia, through collaborative researches between Zambian and Japanese research Institutes.



## Project Outputs

1. Research and education systems for viral zoonoses are established in UNZA-SVM.
2. Diagnostic methods (detection of viral genome, viral-specific antibody and viral antigen) are established/improved for known viral zoonoses such as influenza and viral haemorrhagic fevers.
3. Risks of known and/or unknown (or uncharacterized) viruses as pathogens are assessed on the basis of information on genetic analyses, natural reservoirs, transmission pathways, host ranges and pathogenicity.

**Target Area:** Endemic areas of viral zoonoses in Zambia

**Beneficiaries:** Residents in Zambia

**Country population:** Approx. 13 million



# Project Performance

## at Mid-Term Evaluation (Dec. 2015)

### Whole process of the development of monoclonal antibody is done at UNZA-SVM by themselves:

1. The Project has completed setting up the experimental environment such as the installation of research instruments and other necessary items as well as animal facility to produce monoclonal antibody/-ies. Moreover, Zambian researchers were dispatched to HU and acquired experimental techniques necessary to produce monoclonal antibodies. For these reasons, the Project is ready to start the research work for the development of viral antigen detection method
2. The Project started rearing experiential animals at UNZA-SVM, and has just started to prepare immunogens using gene recombinant techniques.
3. The Project is planning to perform 1st screening of antibodies against NP of Marburg virus to select antibodies with high affinity to viral NP, followed by the preparation of monoclonal antibody for the development of viral antigen detection method for the said virus.

### A surveillance system for viral zoonoses is established in UNZA-SVM:

1. The Project has been continuing the sampling trip to collect faeces of wild aquatic birds to monitor the prevalence of avian influenza viruses epidemiologically at the Lockinvar National Park on a monthly basis after the commencement of the Project. The fecal samples are regularly subjected to isolation and identification of influenza subtypes by the Project.
2. Concerning the African swine fever, UNZA-SVM and CVRI provided diagnostic services for this disease with the support from Japanese researchers at the time of its outbreak in Zambia in 2013. Both institutes established the diagnostic system for the African swine fever independently
3. Responding to the EVD outbreak in western African countries in 2014, UNZA-SVM was designated as the only laboratory to provide EVD diagnostic services in Zambia. Through the countermeasure activities, EVD diagnosis system amongst UNZA-SVM, MOH and UTH including sample flow, information flow (feedback) and other necessary counteractions.

### ***The Project has published a total of 6 scientific articles (one article is in press) with the theme of viral infectious diseases in international journals:***

1. Simulundu E, Nao N, Yabe J, Muto NA, Sithebe T, Sawa H, Manzoor R, Kajihara M, Muramatsu M, Ishii A, Ogawa H, Mweene AS, Takada A. *The zoonotic potential of avian influenza viruses isolated from wild waterfowl in Zambia*. Arch Virol. 2014 Oct;159(10): 2633-40.
2. Changula K, Kajihara M, Mweene AS, Takada A. *Ebola and Marburg virus diseases in Africa: increased risk of outbreaks in previously unaffected areas?* Microbiol Immunol. 2014 Sep;58(9): 483-91.
3. Yabe J, Hamambulu P, Simulundu E, Ogawa H, Kajihara M, Mori-Kajihara A, Changula Chitanga K, Mwase M, Mweemba-Muwowo M, Chambaro HM, Mataa L, Hang'ombe B, Namangala B, Fandamu P, Sawa H, Takada A, Higashi H, Mweene AS. *Pathological and molecular diagnosis of the 2013 African swine fever outbreak in Lusaka, Zambia*. Trop Anim Health Prod. 2015 Feb;47(2): 459-63.
4. Matsuno K, Weisend C, Kajihara M, Matysiak C, Williamson BN, Simuunza M, Mweene AS, Takada A, Tesh RB, Ebihara H. *Comprehensive molecular detection of tick-borne phleboviruses leads to the retrospective identification of taxonomically unassigned bunyaviruses and the discovery of a novel member of the genus phlebovirus*. J Virol. 2015 Jan;89(1): 594-604.
5. Ogawa H, Miyamoto H, Nakayama E, Yoshida R, Nakamura I, Sawa H, Ishii A, Thomas Y, Nakagawa E, Matsuno K, Kajihara M, Maruyama J, Nao N, Muramatsu M, Kuroda M, Simulundu E, Changula K, Hang'ombe B, Namangala B, Nambota A, Katampi J, Igarashi M, Ito K, Feldmann H, Sugimoto C, Moonga L, Mweene A, Takada A. *Seroepidemiological Prevalence of Multiple Species of Filoviruses in Fruit Bats (*Eidolon helvum*) Migrating in Africa*. J Infect Dis. 2015 Oct 1;212 Suppl 2: S101-8.
6. Ndashe K, Simulundu E, Hang'ombe BM, Moonga L, Ogawa H, Takada A, Mweene AS. *Molecular characterization of infectious bursal disease viruses detected in vaccinated commercial broiler flocks in Lusaka, Zambia*. Arch Virol (in press).

## **Implementing Organization**

School of Veterinary Medicine, University of Zambia,  
Ministry of Education, Science and Vocational Training

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Project Director: Vice Chancellor, University of Zambia

Period of cooperation

From June 1st, 2013 to May 31st, 2018



**For further information, please contact;**

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