LinkTADs

D4.5 Collaboration report on the information exchange and discussion of diagnostic technologies for the targeted diseases

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D4.5 Collaboration Report

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Acronyms

EU	European Union
CAHEC	China Animal Health and Epidemiology Centre
HZAU	Huazhong Agriculture University
HVRI	Harbin Veterinary Research Institute
SHVRI	Shanghai Veterinary Research Institute
RVC	Royal Veterinary College
SVA	National Veterinary Institute
TiHo	University of Veterinary Medicine Hannover
ASF	African swine fever
CSF	classical swine fever
PPR	peste des petits ruminants
PCR	polymerase chain reaction

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01.
Introduction

1 Introduction

The objective of WP4 is to select, upgrade and/or implement the cutting-edge diagnostic technologies for early and rapid detection of animal pathogens including zoonotic pathogens via collaboration between EU and Chinese laboratories.

Task 4.1 Establish a network for collaboration between EU and Chinese laboratories (Leader: HVRI, co-leader: Joint FAO/IAEA Division, Partners involved: SHVRI, RVC, SVA, CIRAD)

The major goals of the task are to establish a network for all laboratories involved in this project to exchange and discuss the diagnostic technologies for the targeted diseases. These goals will be achieved through workshops, conferences, training and laboratory visiting. As an outcome of the network, tight collaborations on the targeted diseases between certain laboratories will be established and strengthened. The role and the scope of applications of the advanced diagnostic technologies in the research and disease control areas, between the two partners will be clearly defined. Special emphasis will be given to mirroring and complementary activities in the “problem-solving”-oriented research, with three major goals:

a) To determine similar (mirroring) research activities in the field of development and implementation of advanced diagnostic technologies and to adjust them in a way to omit research overlapping.

b) To upgrade existing and explore new research areas among the research institutions of both partners, EU and China, in a way to maximize the outcomes and impacts of their research.

c) To define the roles and standardize the methodologies to implement the research achievements in national or regional animal disease control plans of both partners.

d) To train young scientists in partners’ laboratories and to carry out comparative evaluations/tests of diagnostic assays and collaborative research on selected topics.

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02.

Collaboration activities and achievements

2 Collaboration activities and achievements

2.1 Collaborations between HVRI and SVA

2.1.1 Dr. Lihong Liu's visit to HVRI

During the 1st WP4 Workshop in Shanghai, Dr. Hua-Ji Qiu from HVRI had a productive talk with Dr. Lihong Liu and Widén Frederik from SVA. Both sides had strong interest to have collaborations in laboratory research and to establish a joint laboratory between SVA and HVRI within the framework of the LinkTADs project. Dr. Hua-Ji Qiu invited scientists from SVA to visit HVRI this year.

At the invitation of Dr. Hua-Ji Qiu, Dr. Lihong Liu visited HVRI on June 24-30, 2014. During the 1-week visit, several research/exchange activities have been carried out, including:

(1) Demonstration of a portable real-time PCR in Dr. Hua-Ji Qiu's lab at HVRI. Dr. Liu also invited two scientists from Tetracore, USA, to give presentations on portable PCR and field diagnostic assays;

(2) Exchange of the research progress of both sides;

(3) Discussion of the possible collaborations in the future between HVRI and SVA.

As achievements of the visit, both parties agreed on the initiation of training programmes of young scientist from both institutes; both sides reached a basic agreement on establishment of the joint laboratory; both sides agreed to start a joint research on the replication of CSFV. A scientific article (Zhou et al., 2014) is jointly published in Vaccine with LinkTADs acknowledged, and several manuscripts are being prepared. Both sides have expanded our collaboration to swine enteric diseases such as diarrhoea. We have agreed to investigate faecal viromes in pig populations in China, Sweden and two other EU countries (Austria and Spain), using metagenomics approach following the same sample preparation and library construction procedures for Illumina MiSeq platform.

Dr. Lihong Liu also visited other institutions (including SHVRI, HZAU, Qingdao Agriculture University, Northwest A&F University, and Inner Mongolian Agriculture University) in China, and conducted collaborative research and discussed the possible collaborations in the future.

2.1.2 Dr. Yuzi Luo's visit to SVA

As one of training programmes between HVRI and SVA, Dr. Yuzi Luo from HVRI visited SVA on October 18-31, 2014. During the visiting, Dr. Yuzi Luo conducted a number of collaborative/exchange activities, including:

(1) Inter-lab evaluation of the E^{rns}-ELISA for CSFV and the PCR for AFSV;

(2) Training in metagenomics and Luminex technologies;

(3) Exchange in some cutting-edge diagnostic technologies;

(4) Learning the SOPs in diagnosis and epidemiology from SVA OIE laboratories;

(5) Presentation on the recent research progress in CSFV and pseudorabies virus at HVRI.

Dr. Yuzi Luo evaluated the PCR method developed by HVRI using the genomic DNA of several reference ASFV strains, which are not available in China and validated the method. The method will be used for identifying the possible introduction of ASFV.

This visit has led to the improvement of the E^{rns}-ELISA for CSFV and the PCR for AFSV.

2.1.3 Joint laboratory

In September 2014, HVRI and SVA reached an agreement through rounds of friendly consultations, resulting in the establishment of the Joint Laboratory of Veterinary Microbiology between HVRI and SVA. The aim of the Joint Laboratory is to enhance the control, improve the diagnostic capabilities and increase the knowledge of infectious animal diseases through the following joint activities:

- Enhancing research collaborations on selected topics, for example novel diagnostic assays for early detection of pathogens,
- Jointly applying for projects from China and Sweden or EU,
- Exchange and training of scientists, especially young researchers
- Exchange of disease information and protocols for diagnostic assays.

Dr. Yuzi Luo's visit to SVA is one of the collaborative activities within the framework of the joint laboratory.

2.2 Collaborations between HVRI and TiHo

2.2.1 Dr. Paul Becher's visit to HVRI

Based on the OIE labortory list provided by Dr. Ivancho Naletoski from IAEA/FAO, Dr. Hua-Ji Qiu from HVRI was able to get in touch with the University of Veterinary Medicine Hannover (TiHo), Germany, which is one of leading players in EU in the prevention and control of TADs, especially CSF. On February 16-20, 2014, Dr. Paul Becher, director of OIE & EU Reference Laboratory for CSF, from TiHo, visited HVRI at the invitation of Dr. Hua-Ji Qiu.

During the visit, the 1st China-Germany Workshop on Classical Swine Fever was held, with about 50 participants including several leading experts on CSF in China, such as Dr. Changchun Tu from The Institute of Military Veterinary of The Chinese Academy of Military Medical Sciences, Dr. Qin Wang from China Animal Drug Control (CADC), Dr. Zhiyong Ma from SHVRI, and Dr. Hua-Ji Qiu from HVRI.

Prof. Becher presented the tasks and recent research activities in the EU/OIE Reference Laboratory, with emphasis on the diagnostic assays and vaccine development in Hannover.

Dr. Hua-Ji Qiu briefed the tasks of his group and presented on a novel vaccine against CSF based on alphavirus replicon and adenovirus chimeric vector, which is a promising marker vaccine for the eradication of CSF in China.

Dr. Changchun Tu talked about the microvesicles, which are associated with the immune invasion of several viruses including CSFV.

Dr. Qin Wang presented the serological diagnostic assays for CSF developed in CADC.

During Dr. Becher's visit, several seminars were held with in-depth discussions with Dr. Hua-Ji Qiu's group on CSF research progress in both sides.

Dr. Becher agreed to make regular exchange of personnel between two laboratories and accept young scientists or students from Harbin to do collaborative research in his laboratory.

2.2.2 Dr. Yuan Sun's visit to TiHo

As one of the exchange activities agreed on between HVRI and TiHo, Dr. Yuan Sun from HVRI visited the University of Veterinary Medicine Hannover (TiHo) on November 5-14, 2014.

The main activities include:

1. Inter-lab evaluation of the ELISA methods for CSFV developed in HVRI;
2. Learning the practices/SOPs in diagnosis and epidemiology from the OIE/EU reference laboratory for CSFV;
3. Exploring the opportunities to collaborate in the future.

During the visit, Dr. Sun gave a talk entitled "Characterization of a pseudorabies virus variant isolated from Bartha-K61-vaccinated swine population in China and development of a gene-deleted vaccine" and discussed the possible collaboration in the swine infectious diseases.

As an achievement of the exchange, both sides agreed to share and contribute to the CSFV Sequence Dataset developed in TiHo and conduct complemental experiments to validate the E^{rns}-ELISA.

2.3 Collaborations among SHVRI, CIRAD and SVA

2.3.1 Exchange activities SHVRI and European partners

Since the kick-off meeting of the LinkTADs project in Rome, Dr. Zhiyong Ma from SHVRI established working ties with a number of European partners with common interests, which led to the creation of a joint proposal on Japanese encephalitis virus (JEV) by SHVRI in collaboration with CIRAD and SVA from Europe. In the 1st WP4 Workshop in Shanghai, he urged all partners to apply for joint projects from China or Europe. During the 1st progress meeting in Shanghai, the three parties (SHVRI, CIRAD and SVA) talked about the details of the proposal and exchanged the ideas and latest findings on some vector-borne diseases including JEV.

2.3.2 Joint proposal

In the early 2014, SHVRI, CIRAD and SVA jointly applied for a proposal entitled "Eco-epidemiology and risk analysis of genotype shift of Japanese encephalitis virus in pigs and mosquitos". The objectives of the proposal are as follows:

(1) To explore the mechanisms of JEV genotype shift and identify the ecological and epidemiological factors associated with JEV genotype shift;

(2) To analyse the risk of JEV genotype shift on JEV control.

Due to the joint efforts of all parties, the proposal has been granted funding from the Ministry of Science and Technology of China. The total budget of the China-EU international S&T collaboration project is 1,270,000 RMB. The 3-year project will begin in January 2015.

2.4 Collaboration between CAHEC and RVC

As one of short-term visit programmes in the LinkTADs project, Dr. Kang Jingli from CAHEC visited RVC on May 6-30, 2014. During the visit, Dr. Jingli Kang undertook a number of training and exchange activities, including:

· Participation in the RVC veterinary epidemiology MSc course on disease control;

· Discussion on the epidemiology and control of peste des petits ruminants, African swine fever and brucellosis;

· Discussion on several projects such as LinkTADs, NEAT and RISKSUR.

During the visit, Dr. Jingli Kang was well trained in surveillance and epidemiology of animal infectious diseases and conducted diverse collaborative activities with the scientists from RVC.

She also visited the Department of Environment, Food and Rural Affairs (DEFRA) of UK to understand the animal health surveillance in the UK, visited the Animal Health and Veterinary Laboratories Agency (AHVLA) afflicted to DEFRA.

2.5 Other collaborative and exchange activities

The following experts participated at the 1st Workshop under WP4 of LinkTads from April 14-16, 2014 and delivered lectures:

- Dr. Trevor Drew, Animal Health and Veterinary Laboratory Agency, UK: Evolution of PRRS and challenges in the control of the disease.
- Dr. Marine Wasniewski , from the ANSES - Laboratoire de la rage et de la faune sauvage de Nancy, Malzeville, France participated at the 1st Workshop under WP4 of LinkTads from April 14-16, 2014 and presentad a lecture on Means for rabies control and surveillance in domestic and wild animals.

The following experts participated at the 2st Workshop under WP4 of LinkTads on September 17, 2014 and delivered presentations:

- Dr. Linda Dixon from the BBSRC-Pirbright Institute, United Kingdom: ASF: molecular and cell biology, vaccine development and immune responses;
- Dr. José Manuel Sanchez-Vizcaino from Facultad de Veterinaria; Universidad Complutense de Madrid, Spain: Key points for the prevention and control of ASF;
- Dr. Jose Maria Blasco from the Centro de Investigación y Tecnología Agroalimentaria de Aragón (CITA), Zaragoza, Spain: Brucellosis Diagnostic Tests and Vaccines: Current Situation;
- Dr. Alessio Lorusso from the Istituto Zooprofilattico Sperimentale dell' Abruzzo e Molise, Teramo, Italy: Activities of the IZSAM in the context of vector-borne diseases (and more).

All the above listed experts are considered as potential partners in the future project developments / applications during or after the LinkTADs implementation.

Additional visits during this first year included:

- Drs. Fusheng Guo, Gwenaelle Dauphin and Filip Claes from FAO visited HVRI and discussed issues related to laboratory networking.

- Dr. Lihong Liu from National Veterinary Institute of Sweden (SVA) visited the College of Veterinary Medicine at HZAU on Oct. 13-14, 2014. He discussed with several professors related to the potential collaboration between SVA and HZAU in the near future.
- Dr. Xiaole Qi and Dr. Xijun He from HVRI visited the ANSES Ploufragan-Plouzané Institute, France, on August 19-28, 2014, under the OIE Twinning Programme for infectious bursal disease (IBD). During the visit, they had a training course and collaborative research on IBD.
- Dr. Anadon Arturo from Complutense University of Madrid, Spain, visited the College of Veterinary Medicine at Huazhong Agricultural University (HZAU) from May 8th to 12th, 2014. He gave a series of seminars related to the progress on toxicology and pharmacology in Europe, including “Veterinary Drugs in Europe” and “Risk assessment of drug residues” etc.
- Dr. Alex Xiaoli Xiong from MRC National Institute for Medical Research in UK visited the College of Veterinary Medicine at HZAU on Nov. 6, 2014. He gave a seminar and presented his work “Monitoring influenza virus receptor binding changes by biophysical and structural analyses”.
- Dr. Xianying Zeng from HVRI participated in the Workshop for TAD Vaccine selection Criteria and Technologies sponsored by IAEA in Vienna on October 28-31, 2014.
- Dr. Zhigao Bu from HVRI attended the Expert Workshop on Peste des Petits Ruminants (PPR) organized by OIE and FAO in Rome, Italy, on October 8-11, 2014, and gave a presentation on PRR in China.
- Dr. Zhiyuan Wen from HVRI attended the 8th Annual Meeting of EPIZONE organized by Technical University of Denmark National Veterinary Institute on 23-25 September, 2014, in Copenhagen, Denmark.
- A number of officials and scientist from FAO, OIE and other institutions visited CADC in Daxing on November 19, 2014, and discussed the possible collaboration with the scientists of the OIE Reference Laboratory for PRRS.

2.6 Conclusions

Since the kick-off meeting of the LinkTADs project in Rome in November 2013, a collaboration network has been established within the framework of the project. Several workshops and a progress meeting were held and several exchange platforms established. Partners use the opportunity to get to know each other’s work; they have established a number of professional links. A number of short-term visits and collaborative/exchange activities have been carried out. Notably, a joint research laboratory has been set up and a joint proposal was granted funding with the mutual efforts of EU and Chinese partners. The next steps will be to expand the existing collaboration network and to organize more exchange activities and collaborations within the network.

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03.

Photos of collaborative activities

3 Photos of exchange programme

3.1 Photos of Dr. Lihong Liu's visiting

3.2 Photos of Dr. Yuzi Luo's visiting

Visiting and studying in SVA

Seminar and discussion: An Brief Introduction to Harbin Veterinary Research Institute and Recent Work on Pseudorabies Virus

3.3 Photos of Dr. Paul Becher's visiting

3.4 Photos of Dr. Yuan Sun's visiting

3.5 MOU on the joint laboratory between HVRI and SVA

MEMORANDUM OF UNDERSTANDING FOR ESTABLISHING
A JOINT LABORATORY OF VETERINARY MICROBIOLOGY
BETWEEN
HARBIN VETERINARY RESEARCH INSTITUTE, CHINESE ACADEMY OF AGRICULTURAL SCIENCES, CHINA
AND
NATIONAL VETERINARY INSTITUTE (SVA), SWEDEN

1 Background and objectives

Harbin Veterinary Research Institute, Chinese Academy of Agricultural Sciences, China (hereinafter referred to as "HVRI/CAAS") and National Veterinary Institute, Sweden (hereinafter referred to as "SVA") are now partners in the EU FP7 project LinkTADs - Linking Epidemiology and Laboratory Research on Transboundary Animal Diseases and Zoonoses in EU and China (http://www.linktads.com). The LinkTADs project brings together world-class research institutes and experts in cross-border cooperation with the aim to coordinate research

disability, veteran status, age, or familial status.

7.2 - This MOU sets forth the plan to enter into collaborative research in the Joint Laboratory. Other than committing to establish the Joint Laboratory, this MOU creates no binding obligations between the Parties, unless otherwise set forth in an addendum to this MOU.

7.3 - Concerning matters of mutual interests that are not covered in this MOU, the Parties agree to discuss those items in a spirit of friendly dialogue at a later date.

Signed on behalf of HVRI/CAAS:

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Signed on behalf of SVA:

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04.

Agenda of selected collaborative activities

4 Agenda of selected collaborative activities

4.1 Agenda of Dr. Paul Becher's visiting

February 16, 2014: Arrival to Harbin.

February 17, 2014: Workshop on CSF.

February 18, 2014: Seminar on CSFV research progress.

February 19, 2014: Seminar on CSF research progress.

February 20, 2014: Discussion on possible collaborations between two labs.

February 20, 2014: Departure from Harbin.

4.2 Agenda of Dr. Yuzi Luo's visiting

October 18, 2014: Departure from Shanghai and arrival to Uppsala of Sweden.

October 20, 2014: Visiting the laboratory of SVA, and a short training for the laboratory safety.

October 21, 2014: Visiting section for virological preparedness and diagnostic, SVA, and studying the surveillance system for infectious diseases in animals.

October 22-23, 2014: Evaluation of CSFV E^{rns}-based indirect ELISA.

October 24-25, 2014: Training of metagenomics technology (detailed procedure and key points).

October 27-28, 2014: Inter-laboratory evaluation of the PCR assay for diagnosis of ASF.

October 29, 2014: Communication with scientists and managers of SVA and Swedish University of Agricultural Sciences and shared the information on the surveillance of animal infectious diseases.

October 30, 2014: Presentation and discussion: introdution of HVRI and recent work on the emerging pseudorabies virus virant in China, exchanging the progress and experiences on the diagnosis, surveillance and control of swine viral diseases in HVRI and SVA.

October 31, 2014: Departure from Stockholm of Sweden.

4.3 Agenda of the 1st China-Germany Workshop on Classical Swine Fever

Harbin Veterinary Research Institute, CAAS

The 1st China-Germany Workshop on Classical Swine Fever

Feb 17, 2014, Monday, at Meeting Room #317, Main Bld., HVRI

Agenda		
8:10-8:20	Opening Remarks	Prof. Hua-Ji Qiu
8:20-8:30	Welcome Address	Prof. Xiaomei Wang
Report		
Chairperson: Prof. Hua-Ji Qiu		
Time	**Topic**	**Speaker**
8:30-9:20	Diagnosis and control of classical swine fever: tasks and recent research activities of the EU reference laboratory for CSF	Prof. Paul Becher
9:20-10:00	Microvesicles and viral immune evasion	Prof. Changchun Tu
10:00-10:10	**Tea break**	
Chairperson: Prof. Zhiyong Ma		
10:10-10:50	Progress in diagnostic assays for classical swine fever virus	Prof. Qin Wang
10:50-11:30	Generation and evaluation of an alphavirus/adenovirus chimeric vector-based vaccine against classical swine fever	Prof. Hua-Ji Qiu
11:30-11:40	Closing Remarks	Prof. Li Feng
11:40-11:45	Photograph	
12:00-13:00	**Lunch**	
Chairperson: Prof. Li Feng and Prof. Hua-Ji Qiu		
13:30-16:30	Discussion (Room 214, main Bld.)	
17:30-19:30	**Dinner**	