FELLOWSHIP SUMMARY REPORTS
REPORT

OECD Co-operative Research Programme (CRP) Research Fellowship

Name: Dr Zhidong Zhang

Subject title: Validation of Diagnostic assay for vesicular diseases: In-house FMDV Asia 1 strip test and SVD empty capsid cELISA

Theme number: 3, The Food Chain

Host Institution: FAO/OIE World Reference laboratory for foot-and-mouth disease, Institute for Animal Health, Ash Road, Pirbright, Woking, Surrey, GU24 0NF, UK

Host Supervisor: Dr. Yanmin Li and Dr. Jef Hammond

Dates of Fellowship: April - May 2012

Consent to posting report on CRP website: yes

2. Relevance The cooperative research programme aims to strengthen the scientific knowledge regarding food chain. Infectious diseases of livestock cause major economic losses and have a major impact on animal health and welfare and food security. Early detection of disease is believed to be fundamental in limiting the magnitude of disease spread. The outcome of the project will develop rapid and robust diagnostic tools with high sensitivity and specificity, which will directly address the need of the research theme Food Chain "New technologies for detection, diagnosis and treatment of old pathogens".

3. Objectives of the Fellowship: Foot-and-mouth disease (FMD) is one of the most highly contagious viral diseases in livestock and is still endemic or sporadic in many countries worldwide. The causative agent, FMD virus, consists of seven antigenically distinct serotypes (O, A, C, Asia 1 and SAT 1, 2 & 3). FMD cannot be clinically differentiated from other vesicular disease including swine vesicular disease (SVD) and vesicular stomatitis (VS). The impact of FMD on society and international trade is very high. Consequently, rapid and accurate laboratory diagnosis is essential for confirmation of any suspected clinical case. To address it, FMD virus serotype O or Asia 1 specific strip test for detection of viral antigen and SVD competitive enzyme-linked immunoabsorbent assay (cELISA) based on a recombinant viral structural antigen (so called viral empty capsid) were developed at National Centre for Foreign Animal Diseases. The scientific objective of this fellowship was to evaluate diagnostic performance of these diagnostic assays with clinical samples archived at FAO/OIE World Reference laboratory for FMD at Institute for Animal Health.

4. Major achievements: Using serum or virus samples archived at Institute for Animal Health, we have successfully validated the diagnostic values of two in-house assays in comparison with the gold standard assay (antigen detection ELISA for FMD virus and conventional cELISA For SVD virus, respectively). To evaluate the in-house cELISA assay for detection of antibodies against SVD virus, more than three hundreds serum samples, which are known serologically for SVD positive or negative, were

examined. For validation of FMD virus serotypes O and Asia 1 specific strip tests, more than one hundred of field tissue samples, which were previously screened for FMD virus serotypes, were analysed. The results demonstrate that both assays have satisfactory specificity and sensitivity, the performance of both tests was comparable to the gold standard assay and will contribute to further improvement of rapid and specific diagnosis of vesicular diseases.

5. Follow up: A publication of these results is envisaged, but will have to await completion of all the related studies. Ongoing collaboration between Institute for Animal Health and National Centre for Foreign Animal Disease will continue and it is expected that a joint grant proposal will be developed. We do not expect any protected intellectual property to result from this fellowship.

6. Satisfaction: This Fellowship completely met my expectations. It enabled me not only to conduct an important piece of research work in the area of rapid assay development, but also to obtain updated knowledge through discussions and collaborations with the world's leading experts in the field of vesicular diseases where I was hosted. I am grateful to the OECD for providing collaboration opportunity by providing partial funding.

7. Advertising the Co-operative Research Programme: I learned about this Program through discussion with my colleague. A wide range of advertising through Research Officers of universities/Research institutes in all designated countries of the Fellowship will be beneficial to all scientists who are seeking the opportunities for collaboration with different institutes, universities or industries in the participating countries.