Thoughts on control and eradication of FMD

Technical/Scientific topics

proposed by OIE/China national FMD reference laboratory

2022.3.18

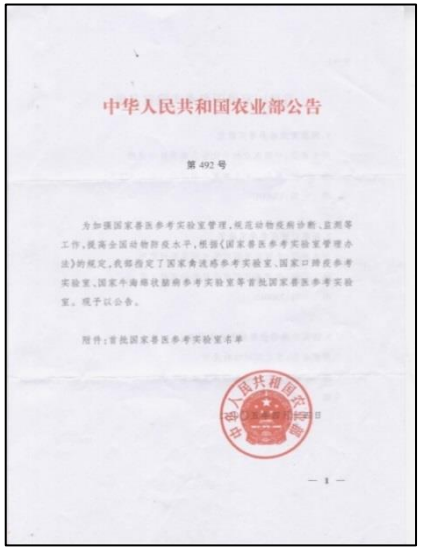
Director General: Prof. Haixue Zheng

- ✓ **Found in 1957**
- ✓ **Nation-wide top academic research Institute**
- ✓ **3 OIE Reference Labs**
- ✓ **The largest platform of high-level laboratory facilities for animal biosafety in China**

OIE/China National Reference Laboratory for FMD

- ✓ Found in 1958 (FMD research group);
- ✓ 2002, Designated as National FMD Reference Laboratory (NFMDRL) by MOA, China
- ✓ 2011, Designated as OIE FMD Reference Laboratory
- ✓ Center of FMD diagnosis, fundamental research, translational research and consulting service in China

Director: Prof. Xiangtao Liu



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Dr Zhang Zhongqiu
Deputy Director General
Ministry of Agriculture
Veterinary Bureau
No.11, Nongzhan Nanli Chaoyang District
100125, Beijing
CHINA (PEOPLE'S REP. OF)

Dear Dr Zhongqiu

Application for designation of OIE Reference Laboratories for Foot and mouth disease, Equine infectious anaemia, White spot syndrome, Infectious hypodermal and haematopoietic necrosis and Spring viraemia of carp

I am pleased to advise you that during its recent annual General Session in Paris, the World Assembly of Delegates of the OIE confirmed the designation of the Lanzhou Veterinary Research Institute of the Chinese Academy of Agricultural Sciences as a new OIE Reference Laboratory for Foot and mouth disease, with Dr Xiangtao Liu as the OIE designated Expert, and also of the Harbin Veterinary Research Institute (HVRI) of the Chinese Academy of Agricultural Sciences as a new OIE Reference Laboratory for Equine infectious anaemia, with Dr Jianhua Zhou as the OIE designated Expert.

Regarding applications for aquatic animal diseases, the Assembly confirmed the designation of the Yellow Sea Fisheries Research Institute (YSFRI), Chinese Academy of Fishery Sciences (CAFS), as two new OIE Reference Laboratories for White spot syndrome and Infectious hypodermal and haematopoietic necrosis, with Dr Jie Huang as the OIE designated Expert, and of the Reference Laboratory of Aquatic Animal Diseases, Shenzhen Exit & Entry Inspection and Quarantine Bureau of China as a new OIE Reference Laboratory for Spring viraemia of carp with Dr Hong Liu as the OIE designated Expert.

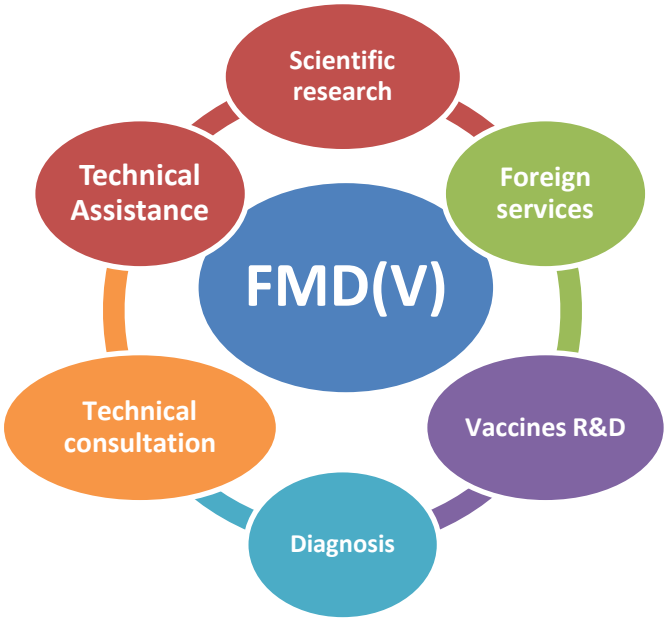
Thank you for your willingness to co-operate with the OIE and its Members, and I look forward to working with Drs Xiangtao Liu, Zhou, Huang and Hong Liu in the future.

With best regards,

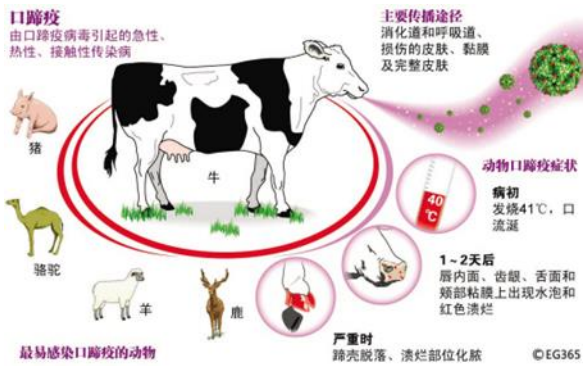
Yours sincerely

Dr Bernard Vallat
Director General

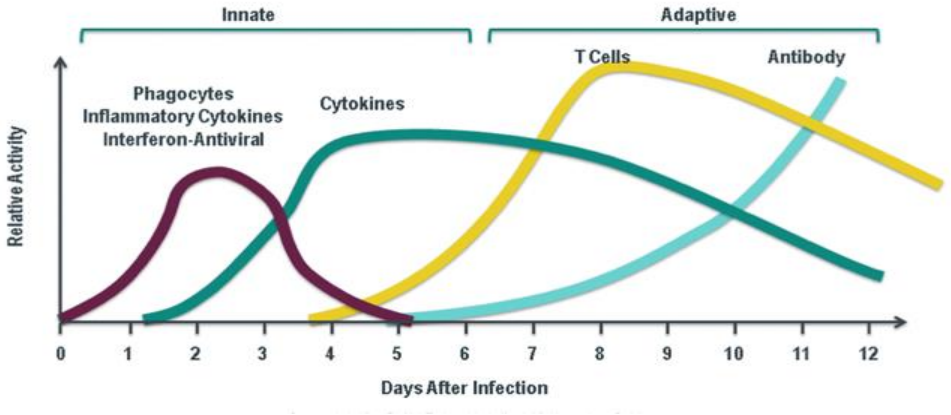
cc: Dr Xiangtao Liu, Dr Jianhua Zhou, Dr Jie Huang, Dr Hong Liu



Proposal 1: Strengthen cooperation on fundamental research



Transmission of FMD(v)



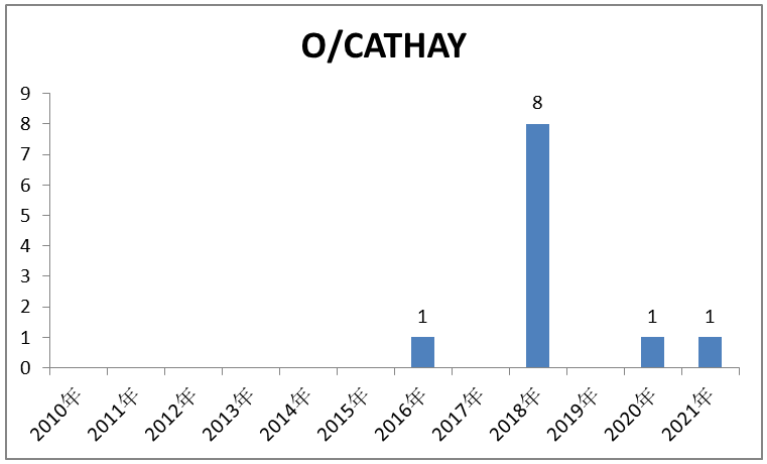
Response to infection or vaccination

Such as:

1. Epidemiological patterns and evolution
2. Molecular basis for phenotypic variation
3. Asymptomatic/persistent infection and possible transmission by carrier
4. Adaptive immune response
5. Molecular mechanism for immune evasion
6. FMD in pigs

Dr. Haixue Zheng zhenghaixue@caas.cn
Dr. Zixiang Zhu zhuzixiang@caas.cn

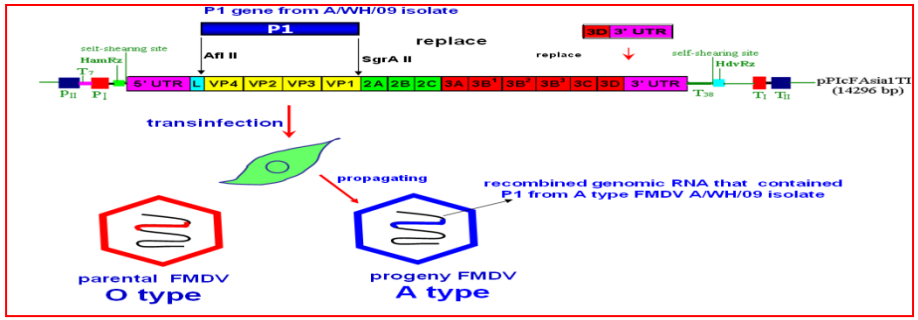
For example, FMDV O/CATHAY strain



- ✓ Circulating and spreading in Southeast Asia-China for a long time
- ✓ It is not well matched by commercial vaccine strains
- ✓ What are these causes?
- ✓ Could we
- share samples/strains,
- share genomic sequences,
- share the information of vaccine matching test
- Joint research
- ……

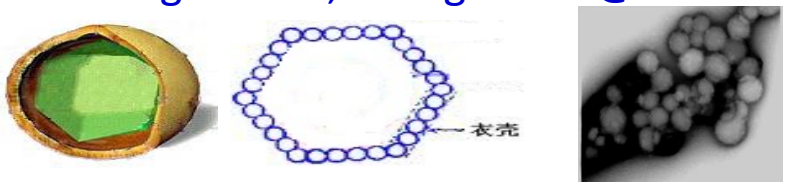
Dr. Zengjun Lu luzengjun@caas.cn
Dr. Fan Yang yangfan@caas.cn

Proposal 2: Development of novel vaccines



Reverse genetic techniques on FMD vaccines

Prof. Zheng Haixue, zhenghaixue@caas.cn



VLPs/ subunit vaccines

Prof. Guo Huichen, guohuichen@caas.cn

mucosal immune

Prof. Pan Li, panli@caas.cn

Traditional vaccines

Effective vaccine

Marker vaccine

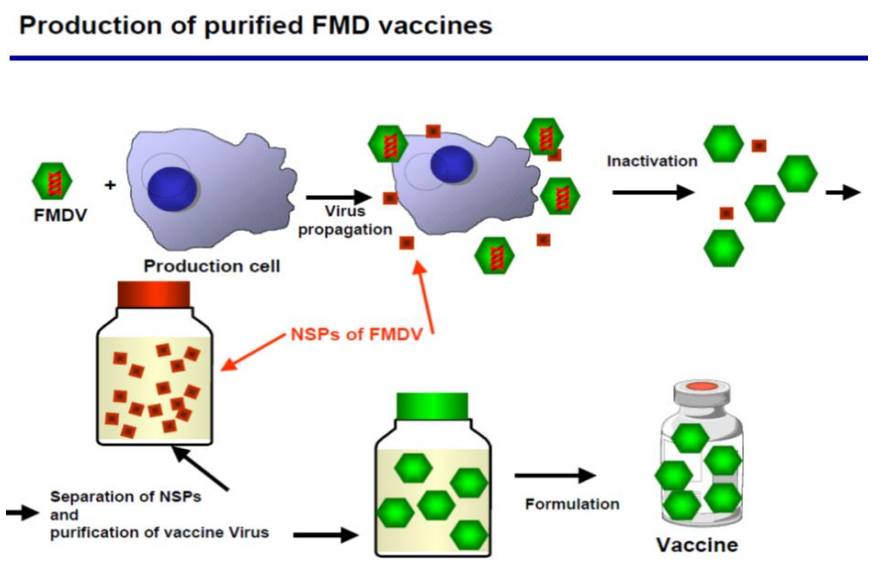
Novel vaccine

The future vaccine

safety
effective
differential diagnosis
low price
sterilizing immunity
…

For example, marker vaccine (3A/3B deleted）

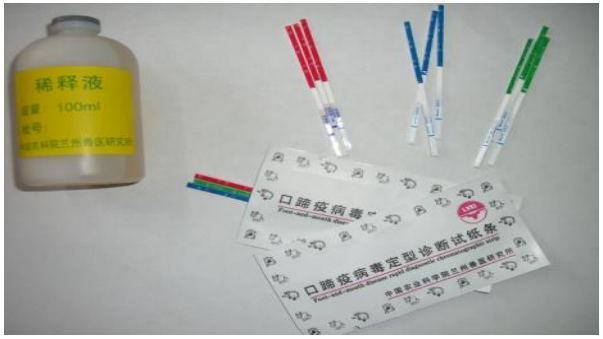
- simplify processing during vaccine production;
- unnecessary to remove NSPs from the vaccine antigens ;
- decrease production cost;
- allow for easy differentiation of vaccinated from infected animals
- 3A or 3B Mab based blocking ELISA developed by LVRI, it is companion serological test of Marker vaccine

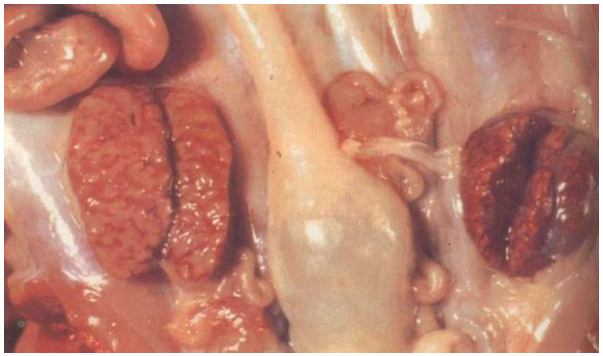


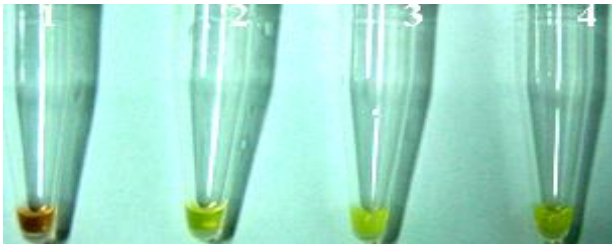
Dr. Zengjun Lu luzengjun@caas.cn

Proposal 3: Rapid diagnostic and quarantine technologies

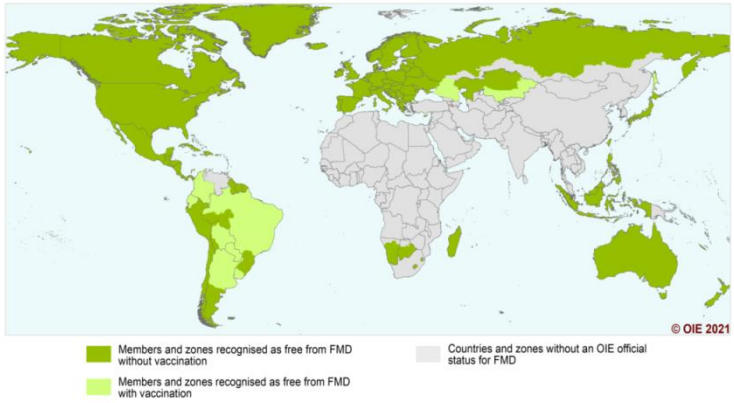
- Fast and real-time diagnosis - STRIP
- Monitoring the FMDV in healthy animals, especially in animals in the long-distance movement
- Novel ELISA for detecting low-level of NSP antigen in traditional vaccines
- Standardize the detection methods in SEACFMD member countries







Proposal 4: FMD free zone with/without vaccination



- ✓ Most FMD-free countries/zones are from Europe and Americas
- ✓ China has established three FMD-free zones with vaccination
- ✓ Pushing the recognition of FMD-free zones by SEACFMD
- ✓ Regional promotion campaign of joint prevention and control of animal diseases (ASF, LSD…)