World Organisation for Animal Health

Yulong Gao - - CHINA_(PEOPLE'S_REP_OF)

WOAH Reference Laboratory Reports Activities 2024

This report has been submitted: 23 janvier 2025 06:55

LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Infectious bursal disease (Gumboro disease)
***Address of laboratory:**	Division of Avian Immunosuppressive Disease, Harbin Veterinary Research Institute (HVRI), Chinese Academy of Agricultural Sciences (CAAS), No. 678, Haping Road, Xiangfang District, Harbin 150069, CHINA (PEOPLES REP. OF)
***Tel:**	+8618945083045
***E-mail address:**	gaoyulong@caas.cn
Website:	
***Name (including Title) of Head of Laboratory (Responsible Official):**	Dr. Zhigao Bu, the director of HVRI, CAAS
***Name (including Title and Position) of WOAH Reference Expert:**	Dr. Yulong Gao
***Which of the following defines your laboratory? Check all that apply:**	Governmental Research agency Academic institution

TOR1: DIAGNOSTIC METHODS

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

Diagnostic Test	Indicated in WOAH Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
ELISA Ab detection	Yes	1568	0
Direct diagnostic tests		Nationally	Internationally
partial amplification of IBDV gene (RT-PCR for VP2 or VP1)	Yes	638	0

virus isolation	Yes	2	0
virus titration using chicken embryo	Yes	4	0
virus titration using cells	Yes	4	0
indirect immunofluorescence assay (IFA) using cells	Yes	35	0
preparation of virus stocks from infected bursa	Yes	4	0
virus gene sequencing of VP2 or VP1	Yes	171	0
Complete virus genome sequencing	Yes	2	0

TOR2: REFERENCE MATERIAL

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOAH?

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members?

No

4. Did your laboratory produce vaccines?

Yes

5. Did your laboratory supply vaccines to WOAH Members?

No

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

Yes

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
Indirect ELISA for IBDV VP2 Antibodies	The laboratory research has been completed and the article is being organized.
Multiplex real-time qRT-PCR for discriminating the predominant epidemic very virulent IBDV (vvIBDV) and variant IBDV (varIBDV)	The laboratory research has been completed and the article is being organized.

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

Yes

9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease?

Yes

Name of the new vaccine developed	Description and References (Publication, website, etc)
The IBD live vaccine	It is currently under review by the Ministry of Agriculture and Rural Affairs of China.

The recombinant MDV vaccine expressing IBDV VP2	It is currently under review by the Ministry of Agariculture and Rural Affairs of China
The subunit vaccine against novel viriant IBDV	The laboratory evaluation has been completed.

TOR4: DIAGNOSTIC TESTING FACILITIES

10. Did your laboratory carry out diagnostic testing for other WOAH Members?

No

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

Yes

Name of the WOAH Member Country receiving a technical consultancy	Purpose	How the advice was provided
EGYPT	Joint application for scientific research projects (ASRT bilateral research proposals with NSFC): Study on the immune escape mechanism and candidate vaccine design of avian influenza virus (AIV) and infectious bursal disease virus (IBDV) under the new epidemic	Joint application for scientific research projects (April 30, 2024)
EGYPT	Negotiate bilateral cooperation with Cairo University and Animal Health Research Institute	Egyptian researchers visit our institute (May 8-10, 2024)
EGYPT	Academic exchange: Prevention, control, and eradication technologies for avian immunosuppressive diseases	Prof Yulong Gao visit Egypt (November 4-8, 2024)
EGYPT	Joint application for International Outstanding Young Scientist Exchange Program Project	Joint application for scientific research projects (September 6, 2024)
UNITED KINGDOM	Academic exchange: Molecular mechanism of antagonism between chicken infectious bursal disease virus and host factors	Dr. Wang Suyan participated in international conference "The 7th International Symposium on the Progress of Sino British Poultry Disease Research" (December 20-22, 2024).
KAZAKHSTAN	Academic exchange: Prevention, control, and eradication technologies for avian immunosuppressive diseases	Prof Yulong Gao participated in international conference " China-Central Asia Animal Disease Prevention and Control Technology Workshop" (November 20-22, 2024).
KYRGYZSTAN	Academic exchange: Prevention, control, and eradication	Prof Yulong Gao participated in international conference " China-Central Asia Animal Disease

	technologies for avian immunosuppressive diseases	Prevention and Control Technology Workshop" (November 20-22, 2024)
TAJIKISTAN	Academic exchange: Prevention, control, and eradication technologies for avian immunosuppressive diseases	Prof Yulong Gao participated in international conference " China-Central Asia Animal Disease Prevention and Control Technology Workshop" (November 20-22, 2024).

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAH Members other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	WOAH Member Countries involved other than your country
Molecular mechanisms of host mediated replication of ALV and other viruses, as well as inhibition or escape of host antiviral responses by ALV and other viruses	2023.9-2026.10	Study the molecular mechanisms of immune escape and immune suppression by pathogens of immunosuppressive diseases such as ALV and IBDV.	The Pirbright Institute	UNITED KINGDOM

13. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

Yes

Research need : 1

Please type the Research need: A novel variant IBDV（nVarIBDV）that causes atypical IBD is currently circulating in Asia, Africa, and South America. The existing vaccines have poor immune protection against this strain. Further systematic research will be conducted on the rapid diagnosis, pathogenic mechanisms, and prevention and control technologies of nVarIBDV. Reference：[1] Fan LJ, Wu TT, Hussain A, Gao YL, Zeng XY, Wang YL, Gao L, Li K, Wang YQ, Liu CJ, Cui HY, Pan Q, Zhang YP, Liu YF, He HJ, Wang XM*, Qi XL*. Novel variant strains of infectious bursal disease virus isolated in China. Veterinary Microbiology, 2019, 230: 212-220. [2] Zhang WY, Wang XM, Gao YL*, Qi XL*. The over-40-years-epidemic of infectious bursal disease virus in China. Viruses, 2022, 14(10): 2253. [3] Wang GD, Jiang N, Yu HB, Niu XX, Huang MM, Zhang YL, Zhang WY, Han JZ, Xu MM, Liu RH, Wu ZW, Han JZ, Wang SY, Gao L, Cui HY, Zhang YP, Chen YT, Gao YL*, Qi XL*. Loop PDE of viral capsid protein is involved in immune escape of the emerging novel variant infectious bursal disease virus. Veterinary Microbiology, 2024, 293: 110094.

Relevance for WOAH Disease Control,

Relevance for the Code or Manual

Field Diagnostics, Vaccines,

Animal Category Terrestrial,

Disease:

Infectious bursal disease (Gumboro disease)

Kind of disease (Zoonosis, Transboundary diseases)

If any, please specify relevance for Codes or Manual, chapter and title

(e.g. Terrestrial Manual Chapter 2.3.5 - Minimum requirements for aseptic production in vaccine manufacture)

Answer:

Notes:

Answer:

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:
Relevant information was collected from the publications.

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:
Disseminate the epidemiological data through the published papers and the academic reports.

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

7

[1] Niu X, Han J, Huang M, Wang G, Zhang Y, Zhang W, Yu H, Xu M, Li K, Gao L, Wang S, Chen Y, Cui H, Zhang Y, Liu C, Wang X, Gao Y, Qi X. Infectious bursal disease virus VP5 triggers host shutoff in a transcription-dependent manner. mBio. 2024, e0343323.

[2] Wang S, Xu Z, Liu Y, Yu M, Zhang T, Liu P, Qi X, Chen Y, Meng L, Guo R, Zhang L, Fan W, Gao L, Duan Y, Zhang Y, Cui H, Gao Y. OASL suppresses infectious bursal disease virus replication by targeting VP2 for degrading through the autophagy pathway. J Virol. 2024, 98(5):e0018124.

[3] Zhang T, Wang S, Liu Y, Qi X, Gao Y. Advances on adaptive immune responses affected by infectious bursal disease virus in chicken. Front Immunol. 2024, 14:1330576.

[4] Wang GD, Jiang N, Yu HB, Niu XX, Huang MM, Zhang YL, Zhang WY, Han JZ, Xu MM, Liu RH, Wu ZW, Han JZ, Wang SY, Gao L, Cui HY, Zhang YP, Chen YT, Gao YL, Qi XL. Loop PDE of viral capsid protein is involved in immune escape of the emerging novel variant infectious bursal disease virus. Veterinary Microbiology, 2024, 293: 110094.

[5] Han J, Niu X, Ge C, Wu Z, Wang G, Huang M, Zhang Y, Liu R, Xu M, Yu H, Han J, Wang S, Liu Y, Chen Y, Cui H, Zhang Y, Duan Y, Wang X, Li L, Gao Y, Qi X. Monoclonal antibody development and antigenic epitope identification of infectious bursal disease virus VP5. The Veterinary Journal. 2024,308:106254.
[6] Zhang WY, Yu HB, Jiang N, Wang GD, Niu XX, Huang MM, Zhang YL, Han JZ, Xu MM, Liu CJ, Wang SY, Li K, Gao L, Cui HY, Zhang YP, Chen YT, Gao YL, Qi XL. Identification and sequence analysis of novel variant infectious bursal disease virus of A2dB1 in some regions of China. Chinese Poultry (in Chinese), 2024, 46(9): 194-200.
[7] Han JZ, Niu XX, Wang GD, Ge CF, Zhang YL, Huang MM, Xu MM, Yu HB, Liu RH, Han JZ, Wu ZW, Yu XX, Gao YL, Li LA, Qi XL. Prokaryotic expression, multi antibody preparation, and preliminary application of chicken infectious bursal disease virus VP5. Chinese Journal of Animal Quarantine (in Chinese), 2024,41(2):92-98.

b) International conferences:

5
[1] China - Central Asia Animal Disease Prevention and Control Technology Workshop, Oral presentation (Yulong Gao), Prevention, control, and eradication technologies for avian immunosuppressive diseases. Sanya, China, November 20-22, 2024.
[2] Workshop on Prevention and Control Technologies for new-Emerging and re-Emerging Significant Infectious Animal Diseases, Oral presentation (Yulong Gao), Prevention, control, and eradication technologies for avian immunosuppressive diseases. Cairo, Egypt, November 4-8, 2024.
[3] Regional Workshop on Avian Disease Prevention and Control in Asia and the Pacific (WOAH), Oral presentation (Yulong Gao), Activity updates on infectious bursal disease in China. Seoul, Republic of Korea, August 27-29, 2024.
[4] Regional Seminar for WOAH National Focal Points for Veterinary Laboratories (online), Participation (Yulong Gao and Xiaole Qi), Tokyo, Japan, July 16-18, 2024.
[5] The 7th International Symposium on the Progress of Sino British Poultry Disease Research, Oral presentation (Suyan Wang), Molecular mechanism of antagonism between chicken infectious bursal disease virus and host factors. Binzhou, China, December 20-22, 2024.

c) National conferences:

14
[1] The Second Frontier Summit on Disease Prevention and Control in the Broiler Breeder Industry in 2024, Oral presentation (Yulong Gao), The Epidemic and Prevention of Avian Immunosuppressive Diseases. Shenyang, China, December 21-22, 2024.
[2] National Technical System for Broiler Industry Service County Economy Seminar, Oral presentation (Yulong Gao), Epidemic Characteristics and Prevention and Control Measures of Infectious Bursal Disease. Yantai, China, December 18-19, 2024.
[3] 40th Anniversary Celebration and the 21st National Academic Seminar of the Animal Infectious Diseases Branch, Chinese Association of Animal Science and Veterinary Medicine, Oral presentation (Yulong Gao), New Progress in the Epidemic Situation and Prevention and Control of Avian Immunosuppressive Diseases in China. Nanjing, China, October 18-20, 2024.
[4] Conference on the Epidemic Situation of Avian Diseases in China in 2024, Oral presentation (Yulong Gao), The Epidemic and Prevention of Avian Immunosuppressive Diseases. Qingdao, China, September 26-27, 2024.
[5] Harbin Weike Biotech Co., Ltd. Forum on Avian Disease Prevention and Control, Oral presentation (Yulong Gao), Current Status of Avian Immunosuppression Epidemic and Its Prevention and Control. Zhengzhou, China, April 23-24, 2024.
[6] Egg Industry and Technology Development Conference and the 4th China Egg Chicken Development Summit, Oral presentation (Xiaole Qi), Epidemic dynamics and prevention and control of chicken infectious bursal disease, Guangzhou, China, November 6-8, 2024.
[7] The 21st Academic Symposium of the Poultry Disease Branch of the Chinese Society of Animal Husbandry and Veterinary Medicine, Oral presentation (Xiaole Qi), Molecular mechanism of immune escape of infectious bursal disease virus, Chengdu, China, October 11-14, 2024.
[8] The 21st Academic Symposium of the Poultry Disease Branch of the Chinese Society of Animal Husbandry and Veterinary Medicine, Poster Presentation (Guodong Wang), Molecular mechanism of immune escape of novel variant infectious bursal disease virus, Chengdu,

China, October 11-14, 2024.
[9] The 21st Academic Symposium of the Poultry Disease Branch of the Chinese Society of Animal Husbandry and Veterinary Medicine, Poster Presentation (Hangbo Yu), Molecular epidemiological survey of infectious bursal disease in some regions of China from 2023 to 2024, Chengdu, China, October 11-14, 2024.
[10] The 43rd Experimental Pathology Public Welfare Online Learning Meetings in 2024 (online), Oral presentation (Xiaole Qi), Protect the immunity of poultry, Shenzhen, China, December 21, 2024.
[11] The Next Generation Veterinary Biologics R & D and Industrialization Convention. Oral presentation (Xiaole Qi), Genetic variation and prevention and control of infectious bursal disease virus, Zhuji, China, April 25-26, 2024.
[12] Lihua Company Technical Exchange Meeting, Oral presentation (Xiaole Qi), Epidemic dynamics and prevention and control of infectious bursal disease, Qingdao, China, June 27, 2024.
[13] 2024 Weilan Company Vaccine Super User Summit, Oral presentation (Xiaole Qi), Epidemic dynamics and prevention and control of infectious bursal disease, Qingdao, China, March 22, 2024.
[14] Heilongjiang Province Poultry System Agricultural Technology Training Course, Oral presentation (Xiaole Qi), Protect the immunity of the chicken flock, Luobei, China, March 15, 2024.

d) Other (Provide website address or link to appropriate information):

0

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAH Members?

Yes

a) Technical visit : 113

b) Seminars : 340

c) Hands-on training courses: 0

d) Internships (>1 month) 0

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
A	CHINA (PEOPLE'S REP. OF)	113
B	CHINA (PEOPLE'S REP. OF)	100
B	CHINA (PEOPLE'S REP. OF)	240

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO/IEC 17025:2017	CNAS certificate	CNAS Certificate.jpg

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Isolation and Identification of Infectious Bursal Disease Virus	CNAS
RT-PCR Assay for Detecting Infectious Bursal Disease Virus	CNAS
ELISA for Antibody Detection of Infectious Bursal Disease Virus	CNAS

20. Does your laboratory maintain a “biorisk management system” for the pathogen and the disease concerned?

Yes

China’s Regulation on Biosafety Management of Pathogenic Microbiology Laboratory

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOAH?

No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOAH?

Yes

Title of event	Date	location	Role (speaker, presenting poster, short communications)	Title of the work presented
Regional Workshop on Avian Disease Prevention and Control in Asia and the Pacific (WOAH)	2024-08-27	Seoul, Republic of Korea	SPEAKER	Activity updates on infectious bursal disease in China
Regional Seminar for WOAH National Focal Points for Veterinary Laboratories	2024-07-18	Tokyo, Japan（online）	SHORT COMMUNICATIONS	

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease?

Yes

24. Do you network (collaborate or share information) with other WOAH Reference Laboratories designated for the same pathogen?

No

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen during the past 2 years?

No

Atypical IBD is seriously threatening the healthy development of the global poultry industry. The existing vaccines have poor immune protection against these strains. We plan to collaborate with IBD WOAH reference lab for IBD in Ploufragan/Plouzane institute of ANSES in France to jointly applicate projects to study the rapid diagnosis, pathogenic mechanisms, and prevention and control technologies of atypical IBD.

26. Did your laboratory collaborate with other WOAH Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

Yes

Title of the project or contract	Scope	Name(s) of relevant WOAH Reference Laboratories
Sino British Joint Laboratory of Poultry Disease Prevention and Control Technology	Systematically investigate and analyze the molecular epidemiology and genetic evolution patterns of important poultry pathogens such as MDV, IBDV, ALV, and AIV (H9). Deeply analyze the infection and pathogenic mechanisms of pathogens from both virus and host perspectives, providing theoretical basis and technical support for the development of new antiviral technologies. Further research on novel genetic engineering vaccines for avian herpes virus and rapid identification and diagnosis technology for poultry diseases, providing new methods and technological products for efficient prevention and control of important poultry diseases.	The Pirbright Institute

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAH Reference Laboratories for the same pathogen during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
Determine whether the prevalent strain in Egypt is nVarIBDV through genetic sequence analysis.	Determine whether the prevalent strain in Egypt is nVarIBDV through genetic sequence analysis.	1	Determine whether the prevalent strain in Egypt is nVarIBDV through genetic sequence analysis.	EGYPT,

TOR12: EXPERT CONSULTANTS

28. Did your laboratory place expert consultants at the disposal of WOAH?

No

29. Additional comments regarding your report:

Yes

Atypical IBD is seriously threatening the healthy development of the global poultry industry. Its pathogen, a novel variant IBDV (nVarIBDV), is currently circulating in Asia, Africa, and South America. Another pathogen, a segment-reassortment IBDV, is currently circulating in Europe. The existing vaccines have poor immune protection against these strains. Further systematic research will be conducted on the rapid diagnosis, pathogenic mechanisms, and prevention and control technologies of atypical IBD. We plan to

collaborate with IBD WOAH reference lab for IBD in Ploufragan/Plouzane institute of ANSES in France to conduct these studies.