World Organisation for Animal Health

Yulong Gao - - CHINA_(PEOPLE'S_REP_OF)

WOAH Reference Laboratory Reports Activities 2025

This report has been submitted: 30 janvier 2026 06:58

LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Infectious bursal disease
***Address of laboratory:**	Division of Avian Immunosuppressive Disease, Harbin Veterinary Research Institute (HVRI), the Chinese Academy of Agricultural Sciences (CAAS), No. 678, Haping Road, Xiangfang District, Harbin 150069, CHINA (PEOPLES REP. OF)
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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	1200	0
Direct diagnostic tests		Nationally	Internationally
partial amplification of IBDV gene (RTPCR for VP2 or VP1)	Yes	630	0
virus isolation	Yes	4	0
virus titration using chicken embryo	Yes	2	0
virus titration using cells	Yes	5	0
indirect immunofluorescence assay (IFA) using cells	Yes	5	0
preparation of virus stocks from infected bursa	Yes	2	0
virus gene sequencing of VP2 or VP1	Yes	101	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.)
Blocking ELISA for detecting variant IBDV 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 has been publicated.

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 (rGtHLJVP2)	It is currently under review by the goverment.
The recombinant MDV vaccine expressing IBDV VP2 (rMDV-VP2-HA)	It is currently under review by the goverment.
The subunit vaccine against novel viriant IBDV (SHG19-VP2)	It is currently under review by the goverment.

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
MALAYSIA	Academic exchange: Infectious bursal disease - evolution and prevention (Yulong Gao); New epidemic strain causing atypical infectious bursal disease: the mutated vvIBDV (mvvIBDV) (Xiaole Qi); OASL inhibits infectious bursal disease virus replication via targeting STING-mediated type I interferon signaling pathway (Suyan Wang).	IBD reference lab for IBD participated in international conference "The XXIII world veterinary poultry association congress" (October 6-10, 2025). Poultry disease technology personnel from major countries around the world attended the conference.
EGYPT	Academic exchange: Infectious bursal disease.	Prof. Xiaole Qi participated in international conference "China-Egypt symposium on animal disease prevention and control technology" (July 21, 2025).
EGYPT	Academic exchange: New epidemic strains causing atypical infectious bursal disease.	Prof. Xiaole Qi participated in international conference "The 9th international conference of the Egyptian society of virology" (October 23, 2025).

EGYPT	Joint application for Intergovernmental scientific and technological cooperation projects: Research on prevention and control techniques for major immunosuppressive diseases in poultry.	Joint application for scientific research projects (June 21, 2025).
KENYA	Academic exchange: Safeguard poultry immunity.	Prof. Xiaole Qi participated in international conference "Seminar on traditional Chinese veterinary medicine" (July 19, 2025). Technical personnel from five countries including Kenya, Jordan, Mali, Nepal, and Cuba participated.
ETHIOPIA	Academic exchange: Prevention and control of major avian infectious diseases.	Prof. Yongzhen Liu participated in international conference "China-Africa agricultural science and technology innovation alliance (CAASTIA) 2025 animal disease prevention and control conference" (October 28. 2025). Poultry disease technology personnel from major African countries attended the conference.
BURUNDI	Technical training: Infectious bursal disease detection technology.	Burundian technician IRIBAGIZA Albert visited our laboratory for training (May 5 - August 2, 2025).
EGYPT	Academic exchange: Infectious bursal disease: evolution and prevention.	Prof. Yulong Gao participated in international conference "Asia-Africa regional workshop on animal disease prevention and control" (November 3, 2025).
JAPAN	Academic exchange: Activity updates on infectious bursal disease in China	Prof. Yulong Gao participated in international conference "WOAH regional workshop on avian disease prevention and control in Asia and the Pacific 2025" (August 26-28, 2025).

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: Atypical IBD is becoming a significant threat to the global poultry industry, causing acute damage to the central immune organs of infected chickens, leading to severe immune suppression and a significant decline in production performance in chicken flocks. Due to the fact that it does not directly kill chickens and makes the spread of this disease more covert, we cannot take it lightly. Currently, at least three types of atypical IBD pathogens have been identified. A novel variant IBDV (nVarIBDV, genotype A3B2d) capable of causing atypical IBD is currently circulating in Asia, Africa, and South America. In addition, a mutated very virulent IBDV (mvvIBDV) has recently been identified in China. Although phylogenetically located within the very virulent IBDV cluster,

key amino acid mutations prevent it from directly causing chicken mortality, which appears to be another survival strategy adopted by the virus. In Europe, atypical IBD is caused by a segment-reassortment strain of genotype A3B1. Substantial evidence indicates that existing vaccines provide poor immune protection against this strain. There is an urgent need for further systematic research on rapid diagnostics, pathogenic mechanisms, and prevention and control technologies targeting these emerging strains.

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:

6

[1] Huang M, Xu M, Han J, Ke E, Niu X, Zhang Y, Wang G, Yu H, Liu R, Wang S, Liu Y, Chen Y, Han J, Wu Z, Cui H, Zhang Y, Duan Y, Gao Y, Qi X. Enhancing MyD88 oligomerization is one important mechanism by which IBDV VP2 induces inflammatory response. PLoS Pathogen. 2025, 21(3):e1012985.

[2] Fan W, Zeng X, Chen Y, Yu Q, Zhang Z, Tian G, Liu C, Bao H, Qi X, Wu L, Zhang Y, Liu Y, Wang S, Cui H, Duan Y, Chen H, Gao Y. A recombinant Marek's disease vaccine candidate provides complete protection against infectious bursal disease virus and H9 subtype avian influenza virus in chickens. Journal of Virology. 2025, 99(10):e0114925.

[3] Wang G, Zhang W, Yu H, Wu Z, Xu M, Han J, Huang M, Zhang Y, Liu R, Ling D, Wang S, Liu Y, Cui H, Zhang Y, Duan Y, Chen Y, Gao Y, Qi X. Development of a neutralizing monoclonal antibody to differentiate the predominant epidemic novel variant IBDV (nVarIBDV) from very virulent IBDV (vvIBDV). International Journal of Biological Macromolecules. 2025, 322(Pt 3):146768.

[4] Yu H, Wang G, Zhang W, Wu Z, Niu X, Huang M, Zhang Y, Liu R, Han J, Xu M, Han J, Ling D, Ke E, Wang S, Cui H, Zhang Y, Chen Y, Liu Y, Duan Y, Gao Y, Qi X. Epidemiological characteristics of infectious bursal disease virus (IBDV) in China from 2023 to 2024: Mutated very virulent IBDV (mvvIBDV) is associated with atypical IBD. Poultry Science. 2025, 104(7):105195.

[5] Yu H, Ling D, Wu Z, He C, Wang G, Liu J, Huang M, Zhang Y, Liu R, Ke E, Liu X, Wang S, Cui H, Zhang Y, Chen Y, Liu Y, Duan Y, Zeng X, Gao Y, Qi X. The mutated very virulent IBDV (mvvIBDV) suppresses immune responses to avian influenza and newcastle disease immunization. Poultry Science. 2025, 105(1):106163.

[6] Zhang W, Wang Y, Wang G, Yu H, Huang M, Zhang Y, Liu R, Wang S, Cui H, Zhang Y, Chen Y, Gao Y, Qi X. Development and Application of Indirect ELISA for IBDV VP2 Antibodies Detection in Poultry. Viruses. 2025, 17(7):871.

b) International conferences:

8

[1] The XXIII world veterinary poultry association congress. Oral presentation (Yulong Gao), Infectious bursal disease (IBD): Evolution and prevention. Kuching, Malaysia. October 6-10, 2025.
[2] The XXIII world veterinary poultry association congress. Oral presentation (Suyan Wang), OASL inhibits infectious bursal disease virus replication via targeting STING-mediated type I interferon signaling pathway. Kuching, Malaysia. October 6-10, 2025.
[3] The XXIII world veterinary poultry association congress. Poster (Xiaole Qi), New epidemic strain causing atypical infectious bursal disease: the mutated vvIBDV (mvvIBDV). Kuching, Malaysia. October 6-10, 2025.
[4] Asia-Africa regional workshop on animal disease prevention and control. Oral presentation (Yulong Gao), Infectious bursal disease: evolution and prevention. Sanya, China. November 3-5, 2025.
[5] China-Africa agricultural science and technology innovation alliance (CAASTIA) 2025 animal disease prevention and control conference. Oral presentation (Yongzhen Liu), Prevention and control of major avian infectious diseases. Addis Ababa, Ethiopia. October 28. 2025
[6] The 9th international conference of the Egyptian society of virology. Oral presentation (Xiaole Qi), New epidemic strains causing atypical infectious bursal disease. Alexander, Egypt. October 23, 2025.
[7] China-Egypt symposium on animal disease prevention and control technology. Oral presentation (Xiaole Qi), Infectious bursal disease. Harbin, China. July 21, 2025.
[8] Seminar on traditional Chinese veterinary medicine. Oral presentation (Xiaole Qi), Safeguard poultry immunity. Harbin, China. July 19, 2025.

c) National conferences:

15

[1] Roundtable seminar: Issues and challenges in the prevention and control of infectious bursal disease. Organized by WOAH reference laboratory for IBD. Shenyang, China. April 12, 2025. More than 20 industry experts and executives from leading enterprises across the country attended the conference for exchange and discussion.
[2] Frontier summit on disease prevention and control in the commercial broiler industry. Organized by WOAH reference laboratory for IBD. Oral presentation (Xiaole Qi), Latest research progress on infectious bursal disease in commercial broiler chickens. Shenyang, China. April 12, 2025.
[3] Frontier summit on disease prevention and control in the commercial broiler industry. Organized by WOAH reference laboratory for IBD. Oral presentation (Yulong Gao), The causes and hazards of avain immunosuppressive diseases. Shenyang, China. April 12, 2025.
[4] The 3rd national veterinary professional degree graduate innovation competition. Oral presentation (Guodong Wang), Protecting the immunity of poultry - key technology research and development for the prevention and control of infectious bursal disease. Guangzhou, China. November 25, 2025.
[5] 2025 veterinary biological products leading innovation seminar. Oral presentation (Yulong Gao), Key technologies for the development of multi valent vaccines for poultry. Changsha, China. November 11, 2025.
[6] The 16th Hashouweike animal disease prevention and control technology forum. Oral presentation (Yulong Gao), The current situation and prevention and control techniques of important avian immunosuppressive diseases. Hangzhou, China. October 15, 2025.
[7] 2025 advanced training course for broiler breeding. Oral presentation (Yulong Gao), New trends and prevention and control strategies of infectious bursal disease. Jinan, China. September 12, 2025.
[8] The 12th veterinary conference and the 2025 animal husbandry and veterinary supplies exhibition. Oral presentation (Yulong Gao), New characteristics and prevention of avian immunodeficiency diseases. Xian, China. August 22, 2025.
[9] The 16th national virology academic symposium. Oral presentation (Suyan Wang), Molecular mechanism of host factors targeting viral proteins to regulate the replication of infectious bursal disease virus in Chickens. Changchun, China. August 17, 2025.
[10] 2025 national science and technology mission Guangxi Dahua Group broiler industry group Seven-Hundred-Lane chicken breeding technology training conference. [8] Oral presentation (Yulong Gao), Comprehensive prevention and control of avian immunosuppressive diseases. Dahua, China. August 12, 2025.
[11] Symposium of poultry disease branch of Chinese society of animal science and veterinary medicine. Oral presentation (Suyan Wang), Study on the molecular mechanism of avian OASL targeting STING to promote IFN expression and inhibit IBDV replication. Guangzhou, China. August 9, 2025.
[12] The 9th (2025) Harbin Yinshuiwan biotechnology forum. Oral presentation (Yulong Gao), Comprehensive prevention and control of avian immunosuppressive diseases. Harbin, China. August 8, 2025.
[13] The 3rd academic exchange conference for doctoral students in veterinary medicine, the Chinese academy of agricultural sciences. Oral presentation (Guodong Wang), Protecting the immunity of poultry - key technology research and development for the prevention and control of infectious bursal disease. Guangzhou, China. July 30, 2025.
[14] The 22nd China animal husbandry expo and 2025 meat breeding chicken disease prevention and control technology summit. Oral presentation (Yulong Gao), New progress in the prevalence and prevention of important immunosuppressive diseases in poultry. Qingdao, China. May 18, 2025.
[15] Training conference of Guangxi Jinling Agriculture and Animal Husbandry Co., Ltd. Oral presentation (Yulong Gao), The current situation and key prevention and control technologies of important immunosuppressive diseases in chickens. Nanning, China. March 20, 2025.

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 : 6

b) Seminars : 23

c) Hands-on training courses: 0

d) Internships (>1 month) 1

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	EGYPT	6
B	MALI	2
B	NEPAL	8
B	KENYA	6
B	JORDAN	4
B	CUBA	3
D	BURUNDI	1

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证书(英文).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
WOAH regional workshop on avian disease prevention and control in Asia and the Pacific 2025	2025-08-26	Sapporo, Japan	speaker	Activity updates on infectious bursal disease in China

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. Are you a member of a network of 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

We have initiated communication with Dr. Nicolas, Director of the WOAH IBD Reference Laboratory at the Ploufragan/Plouzane Institute in France, to discuss and arrange such proficiency testing at the earliest opportunity. Dr. Nicolas has kindly delegated his laboratory assistant, Dr. Pierre-Yves MOALIC, to advance this matter. We are committed to collaborating closely with their laboratory to fulfill this requirement promptly.

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 IBDV, MDV, 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 study 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
Analyzing the types of IBDV prevalent strains in Egypt	Analyzing the types of IBDV prevalent strains in Egypt	1	Analyzing the types of IBDV prevalent strains in Egypt	EGYPT,
RT-qPCR detection for IBDV	RT-qPCR detection for IBDV	3	RT-qPCR detection for IBDV	CHINA (PEOPLE'S REP. OF),
ELISA detection for IBDV Ab	ELISA detection for IBDV Ab	1	ELISA detection for IBDV Ab	CHINA (PEOPLE'S REP. OF),

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) and a mutated very virulent IBDV (mvvIBDV), are currently circulating in Asia, Africa, and South America. Another pathogen, a segment-reassortment IBDV (A3B1), 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 call for an opportunity for international cooperation on this research.