

WOAH Reference Laboratory Reports Activities 2023

Activities in 2023

This report has been submitted : 1 juin 2024 17:50

Laboratory Information

Name of disease (or topic) for which you are a designated WOA Reference Laboratory:	Avian influenza
Address of laboratory:	678 Haping Road, Harbin, 150069, CHINA (PEOPLES REP. OF)
Tel.:	+86-451 51997168
E-mail address:	chenhualan@caas.cn
Website:	www.hvri.ac.cn
Name (including Title) of Head of Laboratory (Responsible Official):	Hualan Chen (Professor, Director)
Name (including Title and Position) of WOA Reference Expert:	Hualan Chen (Professor)
Which of the following defines your laboratory? Check all that apply:	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 WOA Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests			
Hemagglutinin inhibition(H5)		6012	0
Hemagglutinin inhibition(H7)		6012	0
Hemagglutinin inhibition(H9)		6012	0
Hemagglutinin inhibition(H1)		1800	0
Hemagglutinin inhibition(H3)		1800	0
Direct diagnostic tests			
Chicken embros		56729	0
RT-PCR		4100	0

TOR2: REFERENCE MATERIAL

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

No

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

Yes

TYPE OF REAGENT AVAILABLE	RELATED DIAGNOSTIC TEST	PRODUCED/ PROVIDE	AMOUNT SUPPLIED NATIONALLY (ML, MG)	AMOUNT SUPPLIED INTERNATIONALLY (ML, MG)	NO. OF RECIPIENT WOA MEMBER COUNTRIES	COUNTRY OF RECIPIENTS
						CHINA (PEOPLE'S REP.

AI type antigen(H5)	HI serological test	produced	17,866ml	762 ml	2	OF), EGYPT,
AI type antiserum(H5)	HI serological test	produced	4,466 ml	336 ml	2	CHINA (PEOPLE'S REP. OF), EGYPT,
AI type antigen(H7)	HI serological test	produced	10,682ml	0	1	CHINA (PEOPLE'S REP. OF),
AI type antiserum(H7)	HI serological test	produced	2,718 ml	0	1	CHINA (PEOPLE'S REP. OF),
AI type antigen(H9)	HI serological test	produced	3,818 ml	390 ml	2	CHINA (PEOPLE'S REP. OF), EGYPT,
AI type antiserum(H9)	HI serological test	produced	524 ml	170 ml	2	CHINA (PEOPLE'S REP. OF), EGYPT,

4. Did your laboratory produce vaccines?

Yes

5. Did your laboratory supply vaccines to WOAHO Members?

Yes

VACCINE NAME	AMOUNT SUPPLIED NATIONALLY	AMOUNT SUPPLIED NATIONALLY (ML, MG)	NAME OF RECIPIENT WOAHO MEMBERS
Avian influenza virus inactivated vaccine(H5+H7)	317,616,750 mL	437,500 mL	CHINA (PEOPLE'S REP. OF) HONG KONG
Avian influenza virus inactivated vaccine(H5)	0	16,750,000	EGYPT IRAN

TOR3: NEW PROCEDURES

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

No

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

No

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

Yes

NAME OF THE NEW VACCINE DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
Recombinant duck enteritis virus bearing the hemagglutinin genes of H5 and H7 influenza viruses	Zhao, Y., et al., 2023. Recombinant duck enteritis virus bearing the hemagglutinin genes of H5 and H7 influenza viruses is an ideal multivalent live vaccine in ducks. Emerging microbes & infections, 13(1), 2284301.

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

No

TOR4: DIAGNOSTIC TESTING FACILITIES

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

No

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

Yes

NAME OF THE WOAHO MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY	PURPOSE	HOW THE ADVICE WAS PROVIDED
EGYPT	To provide better vaccine against avian influenza in Egypt and ensure that the vaccine seed virus is always antigenically matched to the target virus.	Develop the vaccine.

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

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

Yes

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Title of the study	Duration	PURPOSE OF THE STUDY	PARTNERS (INSTITUTIONS)	WOAH MEMBER COUNTRIES INVOLVED OTHER THAN YOUR COUNTRY
Research on Emerging infectious diseases	2020-2025	The genetic basis of the host range and virulence of influenza viruses	Division of Virology, Department of Microbiology and Immunology; Institute of Medical Science, University of Tokyo, Japan	JAPAN

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

No

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:

H5N1 viruses: In 2021, 17 highly pathogenic avian influenza H5N1 viruses were isolated from wild birds in China. 1,529 clade 2.3.4.4b H5N1 viruses reported globally since October 2020 formed 35 genotypes. The 17 viruses belonged to genotypes G07, which originated from eastern Asia, and G10, which originated from Russia. The viruses were moderately pathogenic in mice but were highly lethal in ducks (Tian, J., et al., 2023, *Emerging Infectious Diseases*, 29(7), 1367-1375.). 28 H5N1 viruses were isolated in poultry between January 2017 and October 2020 during the routine surveillance in China. The H5N1 viruses carried the HA of clade 2.3.2.1c (two strains), 2.3.2.1d (three strains), or 2.3.2.1f (23 strains), and formed eight genotypes. These viruses were antigenically well-matched with the H5-Re12 vaccine strain used in China. Animal studies showed that the pathogenicity of the H5N1 viruses ranged from non-lethal to highly lethal in mice (Xing, X., et al., 2023, *Emerging microbes & infections*, 13(1), 2284294).

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:

- H3N2 virus: Li, J., et al., 2023. Genetic and Biological Characterization of H3N2 Avian Influenza Viruses Isolated from Poultry Farms in China between 2019 and 2021. *Transboundary and Emerging Diseases*, 8834913.
- H3N8 virus: Cui, P., et al., 2023. Analysis of avian influenza A (H3N8) viruses in poultry and their zoonotic potential, China, September 2021 to May 2022. *Euro surveillance*, 28(41), 2200871.
- H10Nx virus: Lv, X., et al., 2023. H10Nx avian influenza viruses detected in wild birds in China pose potential threat to mammals. *One health (Amsterdam, Netherlands)*, 16, 100515.
- H1N1 swine virus: Meng, F., et al., 2023. Continued evolution of the Eurasian avian-like H1N1 swine influenza viruses in China. *Sci China Life Sci*, 66(2), 269-282.
- H5N1 virus: Tian, J., et al., 2023. Highly Pathogenic Avian Influenza Virus (H5N1) Clade 2.3.4.4b Introduced by Wild Birds, China, 2021. *Emerging Infectious Diseases*, 29(7), 1367-1375; Xing, X., et al., 2023. Evolution and biological characterization of H5N1 influenza viruses bearing the clade 2.3.2.1 hemagglutinin gene. *Emerging microbes & infections*, 13(1), 2284294.

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:

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- Meng, B., et al., 2023. Emergence of a novel reassortant H3N6 canine influenza virus. *Frontiers in microbiology*, 14, 1186869.
- Tian, J., et al., 2023. Highly Pathogenic Avian Influenza Virus (H5N1) Clade 2.3.4.4b Introduced by Wild Birds, China, 2021. *Emerging Infectious Diseases*, 29(7), 1367-1375.
- Zhou, X., et al., 2023. Rapid detection of avian influenza virus based on CRISPR-Cas12a. *Virology journal*, 20(1), 261.
- Jiao, C., et al., 2023. Analysis of the conserved protective epitopes of hemagglutinin on influenza A viruses. *Frontiers in immunology*, 14, 1086297.
- Cui, P., et al., 2023. Analysis of avian influenza A (H3N8) viruses in poultry and their zoonotic potential, China, September 2021 to May 2022. *Euro surveillance*, 28(41), 2200871.
- Zhang, Y., et al., 2023. Genetic analysis and biological characterization of H10N3 influenza A viruses isolated in China from 2014 to 2021. *Journal of medical virology*, 95(2), e28476.
- Shi, W., et al., 2023. ABTB1 facilitates the replication of influenza A virus by counteracting TRIM4-mediated degradation of viral NP protein. *Emerging microbes & infections*, 12(2), 2270073.
- Jiang, L., et al., 2023. Advances in deciphering the interactions between viral proteins of influenza A virus and host cellular proteins. *Cell insight*, 2(2), 100079.
- Hu, Y., et al., 2023. M6PR interacts with the HA2 subunit of influenza A virus to facilitate the fusion of viral and endosomal membranes. *Sci China Life Sci*, doi:

10. 1007/s11427-023-2471-4.

10. Zhang, Y., et al., 2023. Key Amino Acid Residues That Determine the Antigenic Properties of Highly Pathogenic H5 Influenza Viruses Bearing the Clade 2.3.4.4 Hemagglutinin Gene. *Viruses*, 15(11), 2249.

11. Lv, X., et al., 2023. H10Nx avian influenza viruses detected in wild birds in China pose potential threat to mammals. *One health* (Amsterdam, Netherlands), 16, 100515.

12. Wu, Y., et al., 2023. CRISPR-Cas13a-based detection method for avian influenza virus. *Frontiers in microbiology*, 14, 1288951.

13. Li, J., et al., 2023. Genetic and Biological Characterization of H3N2 Avian Influenza Viruses Isolated from Poultry Farms in China between 2019 and 2021. *Transboundary and Emerging Diseases*, 8834913.

14. Meng, F., et al., 2023. Continued evolution of the Eurasian avian-like H1N1 swine influenza viruses in China. *Sci China Life Sci*, 66(2), 269–282.

15. Xu, J., et al., 2023. Development and application of DETECTR-based rapid detection for pathogenic *Bacillus anthracis*. *Analytica chimica acta*, 1247, 340891.

16. Zhao, Y., et al., 2023. Recombinant duck enteritis virus bearing the hemagglutinin genes of H5 and H7 influenza viruses is an ideal multivalent live vaccine in ducks. *Emerging microbes & infections*, 13(1), 2284301.

17. Xing, X., et al., 2023. Evolution and biological characterization of H5N1 influenza viruses bearing the clade 2.3.2.1 hemagglutinin gene. *Emerging microbes & infections*, 13(1), 2284294.

b) International conferences:

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(1) Professor Hualan Chen gave a presentation with the title of 'Control highly pathogenic avian influenza by vaccination' at the Zoonotic Influenza Webinar on May 8, 2023.

(2) Professor Hualan Chen gave a presentation with the title of 'Highly pathogenic avian influenza control in China' at the meeting of GARAD Global Alliance for research on avian diseases held in Guildford, UK, on May 22, 2023.

(3) Professor Hualan Chen gave a presentation with the title of 'Highly pathogenic avian influenza control in China' at the 2023 Annual Meeting of Overseas Chinese Society of Microbiology held in Changchun, Jilin of China, on July 7, 2023.

(4) Professor Hualan Chen gave a presentation with the title of 'Vaccine research and use of vaccination against avian diseases' at the meeting of Regional Workshop for Avian Disease Prevention and Control in Asia and the Pacific held in Qingdao, China, on August 30, 2023.

(5) Professor Hualan Chen gave a presentation with the title of 'Characterization and control of clade 2.3.4.4b H5 viruses in China' at the 29th Annual Meeting of the National Reference Laboratories for Avian Influenza and Newcastle Disease of European Union Member States Parma, Italy, on October 2, 2023.

(6) Professor Hualan Chen gave a presentation with the title of 'Alarming situation of highly pathogenic avian influenza' at the 2023 EMI Symposium on November 1, 2023.

(7) Professor Hualan Chen gave a presentation with the title of 'Evolution and Pandemic Potential of the Eurasian Avian-like H1N1 Swine Influenza Viruses' at the 2023 International Conference of Swine Viral Diseases held in Chicago, USA, on November 30, 2023.

(8) Professor Hualan Chen gave a presentation with the title of 'Highly pathogenic avian influenza control: the strategy in China' at 12th Asia Pacific poultry conference held in Nanjing, China, on November 1, 2023.

(9) Professor Chengjun Li gave a presentation with the title of 'Interaction between host proteins and vRNP complex proteins of influenza A virus' at GARAD- One Health Poultry Conference held in Hongkong on May 22, 2023.

c) National conferences:

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(1) Professor Guobin Tian gave a presentation with the title of 'Epidemic trend and prevention and control technology of highly pathogenic avian influenza' in the training course on prevention and control of the key animal diseases held in Guiyang, Guizhou, China, on March 16 2023.

(2) Professor Guohua Deng gave a presentation with the title of 'Surveillance and control of Avian Influenza' in the training course on Animal Influenza Prevention and Control held in Changsha, Hunan, China, on March 27, 2023.

(3) Professor Guobin Tian gave a presentation with the title of 'Current situation and prevention and control of avian influenza in China' in the training course on prevention and control of the key animal diseases held in Shijiazhuang, Hebei, China, on June 27, 2023.

(4) Professor Guobin Tian gave a presentation with the title of 'Application of H5 and H7 avian influenza vaccine in poultry' in the training course on poultry immunization techniques held in Shaoxing of Zhenjiang, China, on May 24, 2023.

(5) Professor Guohua Deng gave a presentation with the title of 'National situation of H5 highly pathogenic Avian Influenza and vaccination in poultry' in the training course on prevention and control of the key animal diseases held in Pingtan of Fujian, China, on August 24, 2023.

(6) Professor Guobin Tian gave a presentation with the title of 'Avian influenza epidemic dynamics and prevention and control in poultry in autumn and winter in China' in the training course on poultry immunization techniques held in Liu'an of Anhui, China, on September 15, 2023.

(7) Professor Jianzhong Shi gave a presentation with the title of 'Surveillance and prevention of animal influenza virus in China' in the training course on poultry immunization techniques held in Changfeng of Anhui, China, on October 9, 2023.

(8) Professor Guobin Tian gave a presentation with the title of 'Avian influenza epidemic dynamics and prevention and control in poultry in autumn and winter in China' at 15th China Poultry Industry Conference held in Zhengzhou of Henan, China, on November 4, 2023.

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

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TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

No

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
GB19489	CNAS BL0113	CNAS-certification in new place-2022.07-01-2026.jpg

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Isolation of influenza virus	ILAC
RT-PCR	ILAC
Haemagglutination inhibition test(HI)	ILAC
Neutralization assay	ILAC

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

Yes

TOR9: SCIENTIFIC MEETINGS

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

No

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

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
Zoonotic Influenza Webinar	2023-05-08	online	speaker	Control highly pathogenic avian influenza by vaccination
GARAD Global Alliance for research on avian diseases	2023-05-22	Guildford, UK	speaker	Highly pathogenic avian influenza control in China
2023 Annual Meeting of Overseas Chinese Society of Microbiology	2023-07-07	Changchun, China	speaker	Highly pathogenic avian influenza control in China
Regional Workshop for Avian Disease Prevention and Control in Asia and the Pacific	2023-08-30	Qingdao, China	speaker	Vaccine research and use of vaccination against avian diseases
29th Annual Meeting of the National Reference Laboratories for Avian Influenza and Newcastle Disease of European Union Member States	2023-10-02	Parma, Italy	speaker	Characterization and control of clade 2.3.4.4b H5 viruses in China
2023 EMI Symposium	2023-11-01	Shanghai, China	speaker	Alarming situation of highly pathogenic avian influenza
2023 International Conference of Swine Viral Diseases	2023-11-30	Chicago, USA	speaker	Evolution and Pandemic Potential of the Eurasian Avian-like H1N1 Swine Influenza Viruses
12th Asia Pacific poultry conference	2023-11-01	Nanjing, China	speaker	Highly pathogenic avian influenza control: the strategy in China
GARAD- One Health Poultry Conference	2023-05-22	Hongkong	speaker	Interaction between host proteins and vRNP complex proteins of influenza A virus

TOR10: NETWORK WITH WOA?H REFERENCE LABORATORIES

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

Yes

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

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOA REF. LABS
OFFLU network	participant	17	ACDP (Australia), ANSES (France), AHRI (Egypt), APHA (UK), APQA (Rep. Korea), ARRIAH, (Russia), CFIAN (Canada), FLI (Germany), HVRI (China), ICAR (India), IZSVe and IZSVL (Italy), Ghent University (Belgium), NIAH (Japan), NVL (Viet Nam), Institut Pasteur (Cambodia), SSI (Denmark), USDA-APHIS NVSL and USDA-ARS NADC (USA), RVC (UK), WUR (Netherlands)

25. Did you organise or participate in inter-laboratory proficiency tests with WOA Reference Laboratories designated for the same pathogen?

No

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

No

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

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

No

TOR12: EXPERT CONSULTANTS

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

Yes

KIND OF CONSULTANCY	Location	SUBJECT (FACULTATIVE)
Member of OFFLU Executive committee	teleconference	Discuss September 2023 WHO VCM meeting data submission (avian and swine influenza)
Global consultation meeting on Avian Influenza (HPAI)	online meeting	Avian Influenza (HPAI)
OFFLU Steering and Executive committee meeting	online meeting	Avian Influenza

29. Additional comments regarding your report:

No