

OIE Reference Laboratory Reports Activities

Activities in 2020

This report has been submitted : 2021-01-14 09:02:14

Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Highly and low pathogenic avian influenza
Address of laboratory:	Südufer 10 D-17493 Greifswald Insel Riems GERMANY
Tel.:	+49-38351 71546
Fax:	+49-38351 71275
E-mail address:	timm.harder@fli.de
Website:	https://www.fli.de/en/institutes/institute-of-diagnostic-virology-ivd/reference-laboratories/oie-fao-and-nrl-for-ai/
Name (including Title) of Head of Laboratory (Responsible Official):	Prof. Dr. Martin Beer, director
Name (including Title and Position) of OIE Reference Expert:	Prof. Dr. Timm C. Harder, head AI reference laboratory
Which of the following defines your laboratory? Check all that apply:	Governmental Research

ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards

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 OIE Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests		Nationally	Internationally
ELISA	Yes	50	0
HI	Yes	80	0
Direct diagnostic tests		Nationally	Internationally
Virus isolation (eggs)	Yes	62	0
RT-qPCR	Yes	7600	850
RT-PCR	Yes	25	45
Sanger sequencing	Yes	19	8
NGS sequencing	Yes	120	14
IVPI	Yes	0	2

**ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards.
To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.**

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

No

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient OIE Member Countries	Region of recipients
Virus RNA	RT-PCR, RT-qPCR	on demand	8	1	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Immune serum	ELISA, HI	archived	9	1	1	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Primers, probes	RT-qPCR	archived	2	1	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Virus antigen	HI	archived	2	0	0	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to OIE Member Countries?

No

ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?

Yes

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?

No

Name of the new test or diagnostic method or vaccine developed	Description and References (Publication, website, etc.)
RT-qPCR array RITA2	Parallel detection of 16 HA and 9 NA subtypes of avian influenza viruses by RT-qPCR. Manuscript in prep.

ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

No

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

No

ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	OIE Member Countries involved other than your country
Use of stable isotopes for investigating avian Influenza epidemiology	4 years	Relate the origin of wild birds by stable isotope Patterns in feathers and overlay with Influenza surveillance data.	Several national avian influenza reference laboratories.	CANADA EGYPT GERMANY IRAN KOREA (REP. OF) NIGERIA UNITED KINGDOM

ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases

11. Did your Laboratory collect epizootiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:
Molecular and epidemiological data related to HPAIV outbreaks in Europe in 2020.

12. Did your laboratory disseminate epizootiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:
Molecular and epidemiological data related to HPAIV outbreaks in Europe in 2020.

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

a) Articles published in peer-reviewed journals: 12

Ayim-Akonor M, Mertens E, May J, Harder T. Exposure of domestic swine to influenza A viruses in Ghana suggests unidirectional, reverse zoonotic transmission at the human-animal interface. *Zoonoses Public Health*. 2020; 67: 697-707. PMID: 32710707

Grund C, Hoffmann D, Ulrich R, Naguib M, Schinköthe J, Hoffmann B, Harder T, Saenger S, Zscheppang K, Tönnies M, Hippenstiel S, Hocke A, Wolff T, Beer M. A novel European H5N8 influenza A virus has increased virulence in ducks but low zoonotic potential. *Emerg Microbes Infect*. 2018; 7: 132. PMID: 30026505

Hassan KE, King J, El-Kady M, Afifi M, Abozeid HH, Pohlmann A, Beer M, Harder T. Novel Reassortant Highly Pathogenic Avian Influenza A(H5N2) Virus in Broiler Chickens, Egypt. *Emerg Infect Dis*. 2020; 26: 129-133.

Hassan KE, Saad N, Abozeid HH, Shany S, El-Kady MF, Arafa A, El-Sawah AAA, Pfaff F, Hafez HM, Beer M, Harder T. Genotyping and reassortment analysis of highly pathogenic avian influenza viruses H5N8 and H5N2 from Egypt reveals successive annual replacement of genotypes. *Infect Genet Evol*. 2020; 84: 104375. PMID: 32454245.

Henritzi D, Petric PP, Lewis NS, Graaf A, Pessia A, Starick E, Breithaupt A, Strebelow G, Luttermann C, Parker LMK, Schröder C, Hammerschmidt B, Herrler G, Beilage EG, Stadlbauer D, Simon V, Krammer F, Wacheck S, Pesch S, Schwemmler M, Beer M, Harder TC. Surveillance of European Domestic Pig Populations Identifies an Emerging Reservoir of Potentially Zoonotic Swine Influenza A Viruses. *Cell Host Microbe*. 2020; 28: 614-627.e6. PMID: 32721380

King J, Schulze C, Engelhardt A, Hlinak A, Lennermann SL, Rigbers K, Skuballa J, Staubach C, Mettenleiter TC, Harder T, Beer M, Pohlmann A. Novel HPAIV H5N8 Reassortant (Clade 2.3.4.4b) Detected in Germany. *Viruses*. 2020; 12: pii:E281.

King J, Harder T, Beer M, Pohlmann A. Rapid multiplex MinION nanopore sequencing workflow for Influenza A viruses. *BMC Infect Dis*. 2020; 20: 648. PMID: 32883215

King J, Harder T, Conraths FJ, Beer M, Pohlmann A. The genetics of highly pathogenic avian influenza viruses of subtype H5 in Germany, 2006-2020. *Transbound Emerg Dis*. 2020. PMID: 32964686

Koethe S, Ulrich L, Ulrich R, Amler S, Graaf A, Harder TC, Grund Ch, Mettenleiter TC, Conraths FJ, Beer M, Globig A. Modulation of lethal HPAIV H5N8 clade 2.3.4.4B infection in AIV pre-exposed mallards, *Emerging Microbes & Infections* 2020; 9: 180-193

Moharam I, Sultan H, Hassan K, Ibrahim M, Shany S, Shehata AA, Abo-ElKhair M, Pfaff F, Höper D, El Kady M, Beer M, Harder T, Hafez H, Grund C. Emerging infectious bronchitis virus (IBV) in Egypt: Evidence for an evolutionary advantage of a new S1 variant with a unique gene 3ab constellation. *Infect Genet Evol.* 2020: 104433. PMID: 32622080.

Parvin R, Schinkoethe J, Grund C, Ulrich R, Bönnte F, Behr KP, Voss M, Samad MA, Hassan KE, Luttermann C, Beer M, Harder T. Comparison of pathogenicity of subtype H9 avian influenza wild-type viruses from a wide geographic origin expressing mono-, di-, or tri-basic hemagglutinin cleavage sites. *Vet Res.* 2020; 51: 48, PMID: 32234073.

Parvin R, Kabiraj CK, Mumu TT, Chowdhury EH, Islam MR, Beer M, Harder T. Active virological surveillance in backyard ducks in Bangladesh: detection of avian influenza and gammacoronaviruses. *Avian Pathol.* 2020; 49: 361-368. PMID: 32271094.

Parvin R, Nooruzzaman M, Kabiraj CK, Begum JA, Chowdhury EH, Islam MR, Harder T. Controlling Avian Influenza Virus in Bangladesh: Challenges and Recommendations. *Viruses.* 2020; 12: 751. PMID: 32664683

b) International conferences: 2

Annual EU-reference laboratory Meeting for AI and ND: One scientific co-presentations, Padova, Italy: online meeting

Reporting on AI surveillance in Europe, EFSA, Parma, Italy: web meeting.

c) National conferences: 1

Continuing education for swine practioners, invited presentation, Geseke, Germany

d) Other:

(Provide website address or link to appropriate information) 1

Hassan KE, Avian influenza infections in poultry farms in Egypt, a continuous challenge: Current problems related to pathogenesis, epidemiology and diagnosis. PhD Thesis, Free University of Berlin, Faculty of Veterinary Medicine, Berlin, Germany:

https://refubium.fu-berlin.de/bitstream/handle/fub188/27881/Disseration_Kareem_Hassan_2020.pdf?sequence=3&isAllowed=y

ToR 7: To provide scientific and technical training for personnel from OIE Member Countries

To recommend the prescribed and alternative tests or vaccines as OIE Standards

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

Yes

a) Technical visits: 0

b) Seminars: 0

c) Hands-on training courses: 0

d) Internships (>1 month): 3

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
d	Egypt	1
d	Bangladesh	1
d	Iran	1

ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned

15. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)
ISO 17025	Akkreditierungsurkunde_FLI-Riems-Jena_2019.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Virus isolation	DAKKS
Antigen detection	DAKKS
Antibody detection	DAKKS
Nucleic acid detection techniques	DAKKS
Sanger and NGS sequencing techniques	

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

Yes

(See *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4*)

ToR 9: To organise and participate in scientific meetings on behalf of the OIE

18. Did your laboratory organise scientific meetings on behalf of the OIE?

No

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

No

ToR 10: To establish and maintain a network with other OIE Reference Laboratories designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results

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

Yes

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

Yes

Purpose of the proficiency tests: ¹	Role of your Reference Laboratory (organiser/ participant)	No. participants	Participating OIE Ref. Labs/ organising OIE Ref. Lab.
Annual PT EU-RL	participant	>30	EU-RL, Padova, Italy
PT APHA	participant	>30	APHA, Weybridge, UK

¹ validation of a diagnostic protocol: specify the test; quality control of vaccines: specify the vaccine type, etc.

22. Did your laboratory collaborate with other OIE 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 OIE Reference Laboratories
OFFLU Technical Group on Wild Birds	AI in wild bird populations	Various scientists, including different OIE reflabs
OFFLU Technical Group on Applied Epidemiology	AI-related epidemiology	Various scientists, including different OIE reflabs
Delta Flu	Advancement of knowledge on avian influenza	Various European RLs

ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than OIE Reference Laboratories for the same disease?

Yes

Note: See Interlaboratory test comparisons in: Laboratory Proficiency Testing at: <http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing> see point 1.3

Purpose for inter-laboratory test comparisons ¹	No. participating laboratories	Region(s) of participating OIE Member Countries
GD Deventer, NL: Antibody detection	> 30	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
GD Deventer, NL: RNA detection	> 30	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East

ToR 12: To place expert consultants at the disposal of the OIE

24. Did your laboratory place expert consultants at the disposal of the OIE?

No

25. Additional comments regarding your report: