OIE Reference Laboratory Reports Activities

Activities in 2020

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Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Classical swine fever
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Name (including Title) of Head of Laboratory (Responsible Official):	Prof. Dr. Paul Becher
Name (including Title and Position) of OIE Reference Expert:	Prof. Dr. Paul Becher
Which of the following defines your laboratory? Check all that apply:	Academic

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	
Indirect diagnostic tests		Nationally	Internationally
Comparative neutralising peroxidase-linked assay (antibodies against CSFV and BDV/ BVDV for discriminating serology testing)	yes	0	217
Enzyme-linked immuosorbent assay (antibodies against CSFV)	yes	0	0
Direct diagnostic tests		Nationally	Internationally
Virus isolation (CSFV)	yes	0	0
Reverse-transcription polymerase chain reaction (CSFV/ Panpesti)	yes	54	27
Genetic Typing (CSFV phylogenetic analysis)	yes	0	0
Enzyme-linked immuosorbent assay (CSFV)	yes	0	0

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
Reference sera for Antibody detection techniques	Neutralising peroxidase-linked (NPLA) assay; enyzme-linked immunosorbent assay (ELISA) for antibody detection	produced & provided	35	318	11	☐Africa ☒Americas ☒Asia and Pacific ☒Europe ☐Middle East
Reference sera for Virus detection techniques	Virus isolation; Reverse-transcription polymerase chain reaction	produced & provided	0	14	1	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East
Monoclonal antibodies (hybridoma cell-culture supernatant)	NPLA; Virus isolation	produced/ provided	0	55	5	☐Africa ☒Americas ☐Asia and Pacific ☒Europe ☐Middle East
Permissive cell line for cell-culture based techniques	NPLA; Virus isolation	produced/ provided	0	0	0	☐Africa ☐Americas ☐Asia and Pacific ☐Europe ☐Middle East
Virus reference strains/ isolates	NPLA; Virus isolation	produced/ provided	0	9	4	☐Africa ☒Americas ☐Asia and Pacific ☒Europe ☐Middle East

RNA (extracted from CSFV positive samples)	Reverse-transcription polymerase chain reaction	produced/ provided	0	1.8	3	☐Africa ☐Americas ☒Asia and Pacific ☒Europe ☐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?

No

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

No

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?

Yes

Name of OIE Member Country seeking assistance	Date (month)	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
SWITZERLAND	October	0	17
BELGIUM	December	0	1

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

Yes

Name of the OIE Member Country receiving a technical consultancy	Purpose	How the advice was provided
MALTA	Validation of ELISA	Remote
ITALY	Validation of qRT-PCR	Remote
FRANCE	Performance of animal experiment; Protocol for propagation of pestiviruses	Remote
CANADA	Interpretation of results obtained in CSFV genotyping	Remote
GREECE	Protocols and control material for qRT-PCR; control material for ELISA	Remote
SWEDEN	Control material for ELISA	Remote
AUSTRIA	Virus isolation	Remote

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
DISCONTOOLS	ongoing	Update on current knowledge on CSF situation, diagnosis and control, gap analysis	The Swedish University of Agricultural Sciences, Uppsala, Sweden; DTU National Veterinary Institute, Denmark; APHA, United Kingdom; Istituto Zooprofilattico Sperimentale dell'Umbria e delle Marche, Perugia, Italy; Wageningen Bioveterinary Research, Lelystad, The Netherlands; Centro de Investigación en Sanidad Animal, INIA-CISA, Valdeolmos, Spain; CODA-CERVA, Ukkel, Belgium ANSES, France Canadian Food Inspection Agency, Canada; DTU Vet, Lindholm, Denmark; Business Economics Group, Wageningen University, The Netherlands IDEXX Technologies GmbH, Switzerland; Friedrich-Loeffler-Institut (FLI), Greifswald – Island Riems, Germany The National Veterinary Institute (SVA), Sweden; National Institute of Animal Health, NARO, Japan	BELGIUM CANADA DENMARK GERMANY ITALY JAPAN SPAIN SWEDEN SWITZERLAND THE NETHERLANDS

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:
-Country Reports on CSF Situation & Laboratory Diagnosis from EU MS and Third Countries -CSF Wild Boar Data of EU MS and Third Countries -EURL Classical- & African swine fever in Wild Boar Surveillance Database (developed by the Friedrich-Loeffler-Institut)

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:
-Country Reports on CSF Situation & Laboratory Diagnosis from EU MS and Third Countries -CSF Wild Boar Data of EU MS and Third Countries -EURL Classical- & African swine fever in Wild Boar Surveillance Database (developed by the Friedrich-Loeffler-Institut)

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: 4
Becher P, Moennig V, Tautz N. Bovine Viral Diarrhea, Border Disease, and Classical Swine Fever Viruses, Reference Module in Life Sciences, 2020, Elsevier, ISBN 9780128096338, https://doi.org/10.1016/B978-0-12-809633-8.21233-8.

Ganges L, Crooke HR, Bohórquez JA, Postel A, Sakoda Y, Becher P, Ruggli N. Classical swine fever virus: the past, present and future. Virus Res. 2020 Nov; 289:198151. doi: 10.1016/j.virusres.2020.198151.

Postel A, Becher P. Genetically distinct pestiviruses pave the way to improved classical swine fever marker vaccine candidates based on the chimeric pestivirus concept. Emerg Microbes Infect. 2020 Dec;9(1):2180-2189. doi: 10.1080/22221751.2020.1826893. PMID: 32962557; PMCID: PMC7580611.

Su A, Fu Y, Meens J, Yang W, Meng F, Herrler G, Becher P. Infection of polarized bovine respiratory epithelial cells by bovine viral diarrhea virus (BVDV). 2020 Dec 10. doi: 10.1080/21505594.2020.1854539. Online ahead of print. PMID: 33300445

b) International conferences: 4
Becher P. Classical swine fever virus and related viruses: an update. The Pirbright Seminar, Jan 16, 2020, Pirbright, U.K.

Becher P. Diagnosis, control, and eradication of classical swine fever virus. Invited keynote lecture at the 9th Leman China Swine Conference, Oct 14-16, 2020, Chongqing, China, online presentation

Becher P. and Postel A. Report of the CSF EURL activities. Workshop of the African and Classical Swine 2020, Hannover, online

Wiedemann A. Results of the Interlaboratory Comparison Test, 2019. Workshop of the Classical Swine Fever Virus 2020, Hannover, online

c) National conferences: 1
Elena Sophie Gräf, Gökce Nur Cagatay, Aleksandra Antos, Paul Becher and Alexander Postel. Characterization of molecular determinants required for the cellular entry process of porcine pestiviruses. Graduate School Days 2020, 21 November, online presentation

d) Other:
(Provide website address or link to appropriate information) 4
CSFV information
http://www.tiho-hannover.de/kliniken-institute/institute/institut-fuer-virologie-zentrum-fuer-infektionsmedizin/eu-and-oie-reference-laboratory/downloads/

Virus Database
http://www.tiho-hannover.de/kliniken-institute/institute/institut-fuer-virologie-zentrum-fuer-infektionsmedizin/eu-and-oie-reference-laboratory/databases/csf-virus-database/

Serum and tissue sample database
http://www.tiho-hannover.de/kliniken-institute/institute/institut-fuer-virologie-zentrum-fuer-infektionsmedizin/eu-and-oie-reference-laboratory/databases

EU Reference Laboratory CSF / ASF WILD BOAR SURVEILLANCE DATABASE
http://public.csf-wildboar.eu

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?

No

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 17025:2018 (flexible scope)	Accreditation certificate_ISO17025.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Isolation, propagation and quantification of CSFV in cell culture	DAkkS/ ILAC-MRA
Detection of CSFV antigen by ELISA	DAkkS/ ILAC-MRA
Detection of antibodies directed against CSFV by ELISA	DAkkS/ ILAC-MRA
Detection of antibodies directed against CSFV by neutralization assay	DAkkS/ ILAC-MRA
Detection of antibodies directed against Border Disease Virus (BDV) by neutralization assay	DAkkS/ ILAC-MRA
Detection of antibodies directed against Bovine Viral Diarrhea Virus (BVDV) by neutralization assay	DAkkS/ ILAC-MRA
Detection of CSFV genome using RT-PCR (and subsequent preparation for genotyping)	DAkkS/ ILAC-MRA
Detection of CSFV genome and detection of genome of other pestiviruses using real-time RT-PCR (SYBR Green)	DAkkS/ ILAC-MRA
Detection of CSFV genome using real-time RT-PCR with TaqMan probe	DAkkS/ ILAC-MRA
Detection of CSFV genome using virotype CSF RT-PCR-Kit	DAkkS/ ILAC-MRA
Detection of ASFV genome using virotype ASF PCR Kit	DAkkS/ ILAC-MRA
Detection of ASF genome using real-time PCR with TaqMan probe	DAkkS/ ILAC-MRA
Isolation, propagation and quantification of BVDV, BDV and other pestiviruses in cell culture	DAkkS/ ILAC-MRA

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?

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
The Pirbright Seminar	01/2020	01/2020 Pirbright, U.K	Speaker	Classical swine fever virus and related viruses: an update
9th Leman China Swine Conference	10/2020	Chongqing, China	Speaker (online presentation)	Diagnosis, control, and eradication of classical swine fever virus

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.
Validation of diagnostic protocols: Real-time RT-PCR Conventional RT-PCR Antigen ELISA, Virus isolation, Sequencing, Virus Neutralization assay Antibody ELISA	organiser	42	participating OIE Ref. Labs: National Veterinary Research Institute, Pulawy, Poland; Animal Health and Veterinary Laboratories Agency, Weybridge, UK; Animal Health Research Institute (AHRI) IRTA CReSA Bellaterra (Barcelona), Spain; China Institute of Veterinary Drug Control, Beijing, China organising OIE Ref. Lab: University of Veterinary Medicine of Hannover, Department of Infectious Diseases, Institute of Virology, Hannover, Germany

[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
Epidemiological Research on CSFV	Molecular screening of sample material from current CSFV outbreaks in Peru during the years 2015-2017	Unidad Centro de Diagnóstico de Sanidad Animal, Lima, Peru
Phylogenetic analysis of CSFV isolates of the CSF outbreak in Japan	Molecular screening of sample material from the current CSF outbreak in Japan	Institute of Animal Health National Agriculture and Food Research Organization, Tokyo, Japan
Characterisation of monoclonal antibodies against Classical Swine fever Virus	Testing of novel monoclonal antibodies against Classical Swine fever Virus using different pestivirus strains (including various genotypes of CSFV)	Animal Health Research Institute, Tamsui, New Taipei City, Taiwan

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
Organizer: Determining laboratory´s capability to conduct specific diagnostic tests: Antigen ELISA Real-time RT-PCR Conventional RT-PCR, Sequencing Virus isolation Virus Neutralization assay Antibody ELISA	42	☐Africa ☒Americas ☒Asia and Pacific ☒Europe ☐Middle East
Participant Determining laboratory´s capability to conduct specific diagnostic test; ELISA organized by National Reference Laboratory for CSF, France (ANSES, Ploufragan)	18	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☒Middle East
Participant Determining laboratory´s capability to conduct specific diagnostic test; Virus Neutralization assay organized by National Reference Laboratory for CSF, France (ANSES, Ploufragan)	10	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐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:

Based on the pandemic situation of CoVID-19, it was not possible to organize face-to-face scientific meetings and hands-on training courses for laboratory personnel from other OIE Member Countries, which are generally performed on an annual basis.

In addition, participation in conferences, meetings and seminars for dissemination of scientific information was restricted due to the pandemic situation of CoVID-19. Exchange of information was preferentially performed via Email or web-based meetings.