

OIE Reference Laboratory Reports Activities

Activities in 2021

This report has been submitted : 2022-01-24 16:24:27

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, Director
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	
		Nationally	Internationally
Indirect diagnostic tests		Nationally	Internationally
Comparative neutralising peroxidase-linked assay (antibodies against CSFV and BDV/ BVDV for discriminating serology testing)	yes	0	9
Enzyme-linked immuosorbent assay (antibodies against CSFV)	yes	0	19
Direct diagnostic tests		Nationally	Internationally
Virus isolation (CSFV)	yes	0	0
Reverse-transcription polymerase chain reaction (CSFV/ Panpesti)	yes	31	20
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; enzyme-linked immunosorbent assay (ELISA) for antibody detection	produced & provided	0	141	11	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americ as <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Reference sera for Virus detection techniques	Virus isolation; Reverse-transcription polymerase chain reaction	produced & provided	0	30,02	2	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americ as <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Monoclonal antibodies (hybridoma cell-culture supernatant)	NPLA; Virus isolation	produced/ provided	2	95	13	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americ as <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Permissive cell line for cell-culture based techniques	NPLA; Virus isolation	produced/ provided	0	240	2	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americ as <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Virus reference strains/ isolates	NPLA; Virus isolation	produced/ provided	0	12	6	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americ as <input type="checkbox"/> Asia and Pacific <input checked="" 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?

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
FINLAND	November	0	20

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
NORTH MACEDONIA (REP. OF)	Protocol for virus isolation and usage of monoclonal antibodies	Remote
JAPAN	Protocols for qRT-PCR	Remote
CHILE	Protocols for Panpesti qRT-PCR	Remote
NORWAY	Information on the new ovine pestivirus with regard to cross reactivity and consequences for the CSFV diagnostics	Remote
ITALY	Quantification of CSFV and control material for CSFV-specific qRT-PCR	Remote
SERBIA	Usage of monoclonal antibodies	Remote
ITALY	Information regarding usage of FCS	Remote
SWITZERLAND	Information regarding new AHL and Manual of Diagnostic Tests in CSF Diagnosis	Remote
CROATIA	Information regarding keeping preparedness of accredited methods	Remote
CANADA	Information regarding lyophilization	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
DISCONTTOOLS	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:

-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: 8

Becher P, Moennig V, Tautz N. Bovine Viral Diarrhea, Border Disease, and Classical Swine Fever Viruses, Reference Module in Life Sciences, 2021, Encyclopedia of virology, Bd. 2, 2021, 153-164. doi: 10.1016/B978-0-12-809633-8.21233-8.

Meyer D, Postel A, Wiedemann A, Cagatay G N, Ciulli S, Guercio A, Becher P. Comparative analysis of Tunisian sheep-like virus, Bungowannah virus and border disease virus infection in the porcine host, 2021, Viruses. 13(8):1539. doi: 10.3390/v13081539.

Su A, Fu Y, Meens J, Yang W, Meng F, Herrler G, Becher P. Infection of polarized bovine respiratory epithelial cells by bovine viral diarrhoea virus (BVDV), 2021, Virulence. 12(1):177-187. doi: 10.1080/21505594.2020.1854539.

Huang Y-L, Meyer D, Postel A, Tsai K-J, Liu H-M, Yang C-H, Huang Y-C, Berkley N, Deng M-C, Wang F-I, Becher P, Croke H, Chang C-Y. Identification of a common conformational epitope on the glycoprotein E2 of classical swine fever virus and border disease virus, 2021, Viruses. 13(8):1655. doi: 10.3390/v13081655.

Postel A, Smith D B, Becher P. Proposed update to the taxonomy of pestiviruses: Eight additional species within the genus Pestivirus, family Flaviviridae, 2021, Viruses. 13(8):1542. doi: 10.3390/v13081542.

Stenberg H, Leveringhaus E, Malmsten A, Dalin A-M, Postel A, Malmberg M. Atypical porcine pestivirus - A widespread virus in the Swedish wild boar population, 2021, Transbound Emerg Dis. doi: 10.1111/tbed.14251.

Cagatay G N, Antos A, Suckstorff O, Isken O, Tautz N, Becher P, Postel A. Porcine complement regulatory protein CD46 is a major receptor for atypical porcine pestivirus but not for classical swine fever virus, 2021, J Virol. 95(9):e02186-20. doi: 10.1128/JVI.02186-20.

Leveringhaus E, Cagatay GN, Hardt J, Becher P, Postel A. Different impact of bovine complement regulatory protein 46 (CD46 bov) as a cellular receptor for members of the species Pestivirus H and Pestivirus G, 2021, Emerg Microbes Infect. doi: 10.1080/22221751.2021.2011620.

b) International conferences: 12

Pavulraj S, Pannhorst K, Borca M, Meyer D, Staut R, Paulsen D, Mwangi W, Becher P, Chowdhury S.I. Novel Pseudorabies Virus (PRV) Vectored bivalent Vaccine against Classical Swine Fever and Porcine Circo, CRWAD Meeting, 03.-07.12.2021, poster.

Postel A, Leveringhaus E, Cagatay GN, Becher P. The Role of the Host Cell Protein CD46 as a Molecular Determinant in Pestivirus Entry, 2021 International Symposium for Classical Swine Fever, Beijing, online, 01.-03.12.2021, presentation.

Becher P. Expanding diversity and host range of pestiviruses: implications for CSF diagnosis and control, 2021 International Symposium for Classical Swine Fever, Beijing, online, 01.-03.12.2021, presentation.

Leveringhaus E, Stenberg H, Malmsten A, Dalin A-M, Postel A, Malmberg M. Atypical porcine pestivirus-A widespread virus in the Swedish wild boar population. German society for Virology, 20th workshop Immunobiology of viral infections, online, 22.09.2021, presentation.

Stenberg H, Leveringhaus E, Malmsten A, Dalin A-M, Postel A, Malmberg M. High seroprevalence of atypical porcine pestivirus (APPV) in the Swedish wild boar population. 1st Congress of the World Society of Virology, online, 16.-18.06.2021, presentation.

Meyer D. Results of the Interlaboratory Comparison Test 2020 - Serology Panel. Online Workshop on National Reference Laboratories for ASF and CSF Diagnosis, online, 08.-09.06.2021, presentation.

Wiedemann A. Results of the Interlaboratory Comparison Test 2020 - Virology and Virus Isolation Panel. Online Workshop on National Reference Laboratories for ASF and CSF Diagnosis, online, 08.-09.06.2021, presentation.

Meyer D, Postel A. Report of the CSF EURL activities in 2020. Online Workshop on National Reference Laboratories for ASF and CSF Diagnosis, online, 08.-09.06.2021, presentation.

Angelichio, M, Postel A, Gow L, Leathers V, Hidalgo, A. Evaluation of the diagnostic performance of RealPCR* CSFV

RNA Test, a new reverse transcriptase real-time PCR for detection of classical swine fever virus (CSFV), 12th European Symposium of Porcine Health Management, online, 14.-16.04.2021, poster.

Cagatay G N, Antos A, Suckstorff O, Isken O, Tautz N, Becher P, Postel A. Porcine complement regulatory protein CD46 is a major receptor for atypical porcine pestivirus but not for classical swine fever virus, 30th Annual Meeting of the Society for Virology, online, 24.-26.03.2021, presentation.

Su A, Fu Y, Meens J, Yang W, Meng F, Herrler G, Becher P. Infection of polarized bovine respiratory epithelial cells by bovine viral diarrhoea virus (BVDV), 30th Annual Meeting of the Society for Virology, online, 24.-26.03.2021, poster.

Meyer D, Postel A, Wiedemann A, Cagatay G N, Becher P. Characterization of pestivirus infection in the porcine host using the example of Tunisian sheep-like pestivirus, 30th Annual Meeting of the Society for Virology, online, 24.-26.03.2021, poster.

c) National conferences: 0

d) Other:

(Provide website address or link to appropriate information) 4

CSFV information

<https://www.tiho-hannover.de/kliniken-institute/institute/institut-fuer-virologie/eu-and-oie-reference-laboratory/csf-facts>

Virus Database

<https://www.tiho-hannover.de/kliniken-institute/institute/institut-fuer-virologie/eu-and-oie-reference-laboratory/databases>

Serum and tissue sample database

<https://www.tiho-hannover.de/kliniken-institute/institute/institut-fuer-virologie/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
2021 International Symposium for Classical Swine Fever, Beijing, online, 01.-03.12.2021	01.-03.12.2021	Online and offline (Beijing, China)	Online presentation	The Role of the Host Cell Protein CD46 as a Molecular Determinant in Pestivirus Entry

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	41	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; CSIRO Australian Centre for Disease Preparedness, Geelong, Australia; Animal Health Research Institute (AHRI), New Taipei City, Chinese Taipei 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
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
Characterisation of monoclonal antibodies against pestiviruses	Testing of monoclonal antibodies using pestivirus strains that were discovered in ruminants, pigs or in non-ungulate hosts.	Animal and Plant Health Agency, Surrey, United Kingdom

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	41	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" 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:

Based on the ongoing 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 preferentially performed by web-based meetings.