

WOAH Reference Laboratory Reports Activities 2025

This report has been submitted: 9 mars 2026 14:36

LABORATORY INFORMATION

| | |
|--|---|
| *Name of disease (or topic) for which you are a designated WOAH Reference Laboratory: | Classical swine fever |
| *Address of laboratory: | Bünteweg 17 30559 Hannover |
| *Tel: | +49-511 953 88 40 |
| *E-mail address: | paul.becher@tiho-hannover.de |
| Website: | https://www.tiho-hannover.de/kliniken-institute/institute/institut-fuer-virologie/eu-and-woah-reference-laboratory |
| *Name (including Title) of Head of Laboratory (Responsible Official): | Prof. Dr. Paul Becher |
| *Name (including Title and Position) of WOAH Reference Expert: | Prof. Dr. Paul Becher, Director |
| *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 WOAH Manual (Yes/No) | Total number of test performed last year | |
|--|-----------------------------------|--|-----------------|
| | | Nationally | Internationally |
| Indirect diagnostic tests | | | |
| Comparative neutralizing peroxidase-linked assay (antibodies against CSFV and BDV/ BVDV for discriminating serology testing) | Yes | 84 | 4 |
| Enzyme-linked immunosorbent assay (antibodies against CSFV) | Yes | 0 | 0 |
| Direct diagnostic tests | | | |
| Virus isolation (CSFV) | Yes | 0 | 0 |
| Reverse-transcription polymerase chain reaction (CSFV/ Panpesti) | Yes | 2 | 2 |
| Genetic Typing (CSFV phylogenetic analysis) | Yes | 0 | 0 |
| Enzyme-linked immuosorbent assay (CSFV) | Yes | 0 | 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?

Paul Becher - - GERMANY

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 |
|--|---|---------------------|-------------------------------------|--|---------------------------------------|---|
| Reference sera for genome detection techniques | Reverse-transcription polymerase chain reaction | produced & provided | 0 | 5,5 | 2 | FRANCE, LITHUANIA, |
| RNA (extracted from CSFV positive samples or RNA transcript) | Reverse-transcription polymerase chain reaction | produced & provided | 0 | 0,05 | 1 | ITALY, |
| Permissive cell line for cell-culture based techniques | NPLA; Virus isolation | produced & provided | 0 | 360 | 2 | AUSTRIA, CROATIA, |
| Monoclonal antibodies (hybridoma cell-culture supernatant) | NPLA; Virus isolation | produced & provided | 0 | 55 | 9 | AUSTRIA, CROATIA, FINLAND, FRANCE, HUNGARY, POLAND, SPAIN, SWEDEN, SWITZERLAND, |
| Reference sera for Antibody detection techniques | Neutralising peroxidase-linked (NPLA) assay; enzyme-linked immunosorbent assay (ELISA) for antibody detection | produced & provided | 2 | 193 | 32 | AUSTRIA, BELGIUM, BULGARIA, CROATIA, CYPRUS, CZECH REPUBLIC, ESTONIA, FINLAND, FRANCE, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, MALTA, MONTENEGRO, NORTH MACEDONIA (REP. OF), NORWAY, POLAND, PORTUGAL, ROMANIA, SERBIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, SWITZERLAND, THE NETHERLANDS, |
| Virus reference strains/ isolates | NPLA; Virus isolation | produced & provided | 0 | 3 | 1 | IRELAND, |

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOA Members?

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 WOA Standards for the designated pathogen or disease?

No

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

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

TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

Paul Becher - - GERMANY

| Name of WOA Member Country seeking assistance | Date | Which diagnostic test used | No. samples received for provision of diagnostic support | No. samples received for provision of confirmatory diagnoses |
|---|------------|---|--|--|
| SWEDEN | 2025-06-10 | Neutralizing peroxidase-linked assay; reverse-transcription polymerase chain reaction | 2 | 0 |

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

Yes

| Name of the WOA Member Country receiving a technical consultancy | Purpose | How the advice was provided |
|--|--|-----------------------------|
| BRAZIL | Information on usage of a DIVA ELISA | remote |
| COLOMBIA | Establishment of the virus neutralization test for antibody detection; use of antibodies to detect viral antigen in the immunoperoxidase assay and fixation of cells | remote |
| CANADA | Amplification of full length E2 sequences by RT-PCR using clinical samples | remote |
| FINLAND | Clarification on validation and/or verification of commercially available kits according to ISO17025 | remote |
| FRANCE | Validation of the best combination of RNA extraction kits and RT-qPCR kits | remote |
| HUNGARY | Staining issues in VNT and usage of monoclonal antibody | remote |
| SWITZERLAND | Detection of CSFV in cell culture by monoclonal antibodies after virus Isolation | remote |
| THE NETHERLANDS | Definition of a suspicion of CSF | remote |
| THE NETHERLANDS | Batch testing of CSF antibody ELISAs | remote |

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOA 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 |
|--------------------|----------|---|--|---|
| DISCONTTOOLS | ongoing | Update on current knowledge on CSF situation, diagnosis and control, gap analysis | <p>APHA, United Kingdom; USDA, Plum Island, USA Intervet International, MSD Animal Health, The Netherlands</p> <p>Boehringer Ingelheim Vetmedica GmbH, Germany; Friedrich-Loeffler-Institut (FLI), Greifswald – Island Riems, Germany</p> <p>Laboratory of Microbiology, Department of Disease Control, Faculty of Veterinary Medicine, Hokkaido University, Japan</p> | <p>JAPAN THE NETHERLANDS</p> <p>UNITED KINGDOM UNITED STATES OF AMERICA</p> |

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?

Paul Becher - - GERMANY

Yes

If the answer is yes, please provide details of the data collected:

- Country Reports on CSF Situation and Laboratory Diagnosis from EU - and Non-EU Member States countries
- CSF Wild Boar Data of EU - and Non-EU Member States countries
- EURL Classical- and African swine fever in Wild Boar Surveillance Database (developed by the Friedrich-Loeffler-Institute)

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:

- Country Reports on CSF Situation and Laboratory Diagnosis from EU - and Non-EU Member States countries
- CSF Wild Boar Data of EU - and Non-EU Member States countries
- EURL Classical- and African swine fever in Wild Boar Surveillance Database (developed by the Friedrich-Loeffler-Institute)

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:

4

Söder L, Meyer D, Isken O, Tautz N, König M, Postel A, Becher P. Characterization of the First Marine Pestivirus, *Phocoena Pestivirus (PhoPeV)*, 2025, *Viruses*. <https://doi.org/10.3390/v17010107>.

Ortmann, S., Lindner, T., Meyer, D., Wiedemann, A., Postel, A., Becher, P., Vos, A. Comparison of the serological responses in pigs after oral vaccination against classical swine fever using two different types of bait. 2025, *Veterinary Immunology and Immunopathology*. <https://doi.org/10.1016/j.vetimm.2025.110937>.

Roman-Sosa G., Meyer D., Dellarole M., Wengen D., Lerch S., Postel A., Becher P. Virus-neutralizing monoclonal antibodies against bovine viral diarrhea virus and classical swine fever virus target conformational and linear epitopes on E2 glycoprotein subdomains. *Microbiology Spectrum*. <https://doi.org/10.1128/spectrum.02041-24>

Pitters, M., Fritsch, H., Su, A., Jung, K., Becher, P. Application of bovine nasal epithelial cells as an *in vitro* model for studying viral infection in the upper respiratory tract. *Viruses*. <https://doi.org/10.3390/v17091188>.

b) International conferences:

10

Leveringhaus, E. S., Poljakovic, R., Becher, P., Postel, A. The CD46 receptor – Does this "pathogens' magnet" restrict the risk for a pestiviral host switch? 34th Annual Meeting of the Society for Virology, Hamburg, Germany, 04.-07.03.2025, poster presentation.

Leveringhaus, E. S., Poljakovic, R., Becher, P., Postel, A. The CD46 Receptor: does this "pathogens' magnet" restrict the risk for a pestiviral host switch? 13th International Congress for Veterinary Virology, Portoroz, Slovenia, 02.09.-05.09.2025, oral presentation.

Meyer D. Results of the Interlaboratory Comparison Test 2024-2025 –Serology Panel. Workshop on Laboratory Diagnosis of ASF and CSF, Madrid, Spain, 03.-04.06.2025, oral presentation.

Meyer D. Report of the CSF EURL activities in 2023-2024 and additional research activities. Workshop on Laboratory Diagnosis of ASF and CSF, Madrid, Spain, 03.-04.06.2025, oral presentation.

Meyer D., Söder L., Isken O., Tautz N., König M., Lamp B., Rümenapf T., Gremmel N., Postel A., Siebert U., Schick L. A., Groß S., Brackmann J., Bächlein C., Becher, P. Novel insights into cell tropism, kinetics of virus growth and prevalence of *Phocoena pestivirus* in harbour porpoises. 13th International Congress for Veterinary Virology, Portoroz, Slovenia, 02.09.-05.09.2025, poster presentation.

Pitters M., Fritsch H., Yan M., Su A., Becher P. Infection of primary bovine nasal epithelial cells with bovine viral diarrhea virus and bovine herpesvirus-1. 34th Annual Meeting of the Society for Virology, Hamburg, Germany, 04.-07.03.2025, oral presentation.

Postel A. The CD46 receptor – A "pathogens' magnet" that determines host cell tropism? Workshop on Laboratory Diagnosis of ASF and CSF, Madrid, Spain, 03.-04.06.2025, oral presentation.

Wiedemann A. Results of the Interlaboratory Comparison Test 2024-2025 –Virology Panel. Workshop on Laboratory Diagnosis of ASF and CSF, Madrid, Spain, 03.-04.06.2025, oral presentation.

Wiedemann A. Results of the Interlaboratory Comparison Test 2024-2025 –Virus Isolation Panel. Workshop on Laboratory Diagnosis of ASF and CSF, Madrid, Spain, 03.-04.06.2025, oral presentation.

Söder L., Meyer D., Gremmel N., Postel A., Isken O., Tautz N., König M., Siebert U., Schick L. A., Groß S., Brackmann J., Bächlein C., Becher P. Further characterization of *Phocoena pestivirus*: New insights into host cell tropism, viral growth kinetic, and prevalence in harbour porpoises. 34th Annual Meeting of the Society for Virology, Hamburg, Germany, 04.-07.03.2025, poster presentation.

c) National conferences:

3

Fritsch, H., Su, A., Pfarrer, C., Becher, P. Innate immune defense at the feto-maternal interface of the bovine placenta: insights from Poly(I:C) and BVD studies. 18th Graduate School Day, Hannover, Germany, 21.11.2025, poster presentation.

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

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

Yes

a) Technical visit : 0

b) Seminars : 0

c) Hands-on training courses: 3

d) Internships (>1 month) 0

| 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 |
|--|---|---|
| C | CZECH REPUBLIC | 2 |
| C | SLOVAKIA | 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 17025 | pdf | DAkks Urkunde englisch_2020.pdf |

19. 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 | DAkks /ILAC-MRA |

Paul Becher - - GERMANY

| neutralization assay | |
|--|-----------------|
| 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 |
| Isolation, propagation and quantification of BVDV, BDV and other pestiviruses in cell culture | DAkkS /ILAC-MRA |

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

Yes

A biological risk analysis is performed by the head of the laboratory together with the management of laboratory biological risk. Biosafety and laboratory biosecurity measures are implemented and summarized in the corresponding operating instructions of the laboratory.

TOR9: SCIENTIFIC MEETINGS

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

No

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

No

TOR10: NETWORK WITH WOAHP REFERENCE LABORATORIES

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

Yes

24. Are you a member of a network of WOAHP Reference Laboratories designated for the same pathogen?

Yes

| NETWORK/DISEASE | ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC) | NO. PARTICIPANTS | PARTICIPATING WOAHP REF. LABS |
|--|---|------------------|--|
| WOAHP-Terrestrial Manual , Chapter CSF | Update of the vaccine part and justification for the listed diagnostic methods in the chapter CSF of the WOAHP Terrestrial Manual | 7 | China, Japan, UK, Germany, Spain, Chinese Taipei, Poland, Canada |

25. Did you organise or participate in inter-laboratory proficiency tests with WOAHP Reference Laboratories designated for the same pathogen during the past 2 years?

Yes

| Purpose of the proficiency test: | Role of your Reference Laboratory (organiser/ participant) | No. participating Laboratories | Participating WOAHP Ref. Labs/ organising WOAHP Ref Lab |
|--|--|--------------------------------|---|
| Validation of diagnostic protocols: Real-time RT-PCR Conventional RT-PCR Antigen ELISA, Virus isolation, Sequencing, Virus Neutralization assay Antibody ELISA | organiser | 2 | participating WOAHP Ref. Labs: National Veterinary Research Institute, Pulawy, Poland; Veterinary Research Institute, Council of Agriculture, New Taipei City, Chinese Taipei |

26. Did your laboratory collaborate with other WOAHP 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 WOAHP Reference Laboratories |
|--|---|--|
| Characterization of monoclonal antibodies against pestiviruses | Testing of novel monoclonal antibodies against Classical Swine fever Virus using different pestivirus strains (including various genotypes of CSFV) | Veterinary Research Institute, Tamsui, New Taipei City, Chinese Taipei |
| Characterization 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 |

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAHP Reference Laboratories for the same pathogen during the past 2 years?

Yes

| Purpose for inter-laboratory test comparisons ¹ | Role of your reference laboratory (organizer/participant) | No. participating laboratories | Name of the test | WOAH Member Countries |
|---|---|--------------------------------|---|---|
| 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 | organizer | 37 | ILCT for CSF 2025 | ALBANIA, AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CHINESE TAIPEI, CROATIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, MALTA, MEXICO, MOLDOVA, MONTENEGRO, NORTH MACEDONIA (REP. OF), NORWAY, POLAND, PORTUGAL, ROMANIA, SERBIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, SWITZERLAND, THE NETHERLANDS, |
| ILPT CSF Virus Neutralization Test 2025 | participant | 8 | ILPT CSF Virus Neutralization Test 2025 | FRANCE, GERMANY, |

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

No