

WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted : 26 avril 2023 11:56

Laboratory Information

Name of disease (or topic) for which you are a designated WOA Reference Laboratory:	Classical swine fever
Address of laboratory:	Institute of Agrifood Research and Technology (IRTA), Centre de Recerca en Sanitat Animal (CReSA), Edifici CReSA Campus de la Universitat Autònoma de Barcelona Bellaterra 08193 (Barcelona) SPAIN
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E-mail address:	llilianne.ganges@irta.cat
Website:	https://www.irta.cat/ca/produccio-animal/sanitat-animal/ https://www.irta.cat/es/centre/irta-cresa/
Name (including Title) of Head of Laboratory (Responsible Official):	Dr. Josep Usall, General Director at IRTA
Name (including Title and Position) of WOA Reference Expert:	Dr. Lilianne Ganges, Principal investigator at IRTA-CReSA, Head in the CSF WOA Reference Laboratory
Which of the following defines your laboratory? Check all that apply:	Governmental

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	
Indirect diagnostic tests		Nationally	Internationally
ELISA: Classical swine fever virus	Yes	256	

(CSFV) Antibody test Kit (IDEXX)			
Seroneutralization (NPLA Test)	Yes	688	
Direct diagnostic tests		Nationally	Internationally
RT-qPCR for CSFV RNA detection (Hoffmann et al., 2005)	Yes	1637	
Conventional RT-PCR (Vilcek et al., 1994)	Yes	9	
Duplex ASF/CSF RT-qPCR	No	20	

TOR2: REFERENCE MATERIAL

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

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOA?H 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?H MEMBER COUNTRIES	COUNTRY OF RECIPIENTS
Reference RNA	RT-qPCR for CSFV specific RNA detection (Hoffmann et al., 2005)	Produced and Provided	0	160 samples of 0,1mL	16	America
Reference sera	ELISA: Classical swine fever virus (CSFV) Antibody test Kit (IDEXX) and Seroneutralization (NPLA Test)	Produced and Provided	0	160 samples of 1 mL	16	America

4. Did your laboratory produce vaccines?

Not applicable

5. Did your laboratory supply vaccines to WOA?H Members?

Not applicable

TOR3: NEW PROCEDURES

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

Yes

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

Yes

NAME OF THE NEW TEST OR DIAGNOSTIC METHOD DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
Duplex ASF/CSF RT-qPCR	Development of a new Duplex real-time PCR assay for the molecular detection of classical swine fever and African swine fever viruses in the same reaction tube. IT-A4-EPCR 053 in IRTA-CReSA, CEA-ENAC-22 Type II Method

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

No

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

Yes

NAME OF THE NEW VACCINE DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
The FlagT4G Vaccine	The FlagT4G Vaccine Confers a Strong and Regulated Immunity and Early Virological Protection against Classical Swine Fever. Bohórquez JA, Wang M, Díaz I, Alberch M, Pérez-Simó M, Rosell R, Gladue DP, Borca MV, Ganges L. Viruses. 2022 Sep 2;14(9):1954. doi: 10.3390/v14091954.

TOR4: DIAGNOSTIC TESTING FACILITIES

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

No

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

Yes

NAME OF THE WOAHP MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY	PURPOSE	HOW THE ADVICE WAS PROVIDED
COLOMBIA	Consultation on biosafety and biocontainment standards for working in a biosafety level 3 laboratory with classical swine fever virus	remote
ECUADOR	Consultation on how to make the molecular diagnosis of classical swine fever virus and what type of material is required	remote
CUBA	new molecular methods for the diagnosis of viruses in swine	in loco
PERU	Interpretation of the serum neutralization test (NPLA	remote
PARAGUAY	CSFV inactivation methods in reference sample panels	remote
UNITED STATES OF AMERICA	Treatment of reference samples for the CSFV interlaboratory test	remote
ARGENTINA	Commercial/available diagnostic kits for the detection of antibodies against CSFV	remote
PERU	Consultation for CSFV vaccine virus detection in animals after vaccination with live attenuated vaccines against	remote
ECUADOR	Vaccine potency test against CSFV	remote
ECUADOR	Protocols for the molecular detection of CSFV by RT-qPCR (field strains and vaccine strains)	remote

ECUADOR

Kits available for the extraction of ASFV DNA from tissues and kits for molecular diagnostics

remote

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAH 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
European Researchgroup: EPIZONE	Indefinite	Strengthen the cooperation between National and International Reference Laboratories in the field of Epizootic diseases. - facilitate and coordinate scientific research applied to "Epizootic Disease Diagnosis and Control" - develop and support strategies for durable cooperation, particularly to inform about opportunities for further funding - develop, share and upgrade common research tools and platforms for joint research projects - develop common research methods, standards and protocols - share data and information among partners and better facilitate public access to selected information on epizootic diseases	-L'Agence nationale chargée de la sécurité sanitaire de l'alimentation, de l'environnement et du travail (ANSES), France - Animal and Plant Health Agency (APHA), UK - Centre de Recerca en Sanitat Animal (IRTA-CReSA), Spain - Wageningen Bioveterinary Research (WBVR), Netherlands - Technical University of Denmark, National Veterinary Institute (DTU Vet), Denmark - Friedrich-Loeffler Institute (FLI), Germany - Institute for Animal Health (IAH) UK - Institute of Virology and Immunology (IVI), Switzerland - Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna Brescia (IZSLER), Italy - Istituto Zooprofilattico Sperimentale delle Venezie (IZS-Ve), Italy - National Research Institute of Veterinary Virology and Microbiology (NRIVaMR), Russia - National Veterinary Research Institute (NVRI), Poland - Statens Veterinärmedicinska Anstalt (SVA), Sweden - Veterinary and Agrochemical Research centre, VARCODA-CERVA (VAR), Belgium - Emerging Pathogens Institute, University of Florida (EPI), USA	SWEDEN
CSFV virulent factors	2017-2026	Update on CSFV pathogenesis for disease control	Institute of Virology and Immunology	SWITZERLAND
CSFV Diagnosis, pathogenesis and evolution studies	2017-2022	study of CSFV variants circulating in endemic situation under vaccination	CENSA, Cuba - Institute of Veterinary Medicine, Cuba	CUBA

CSFV diagnosis and vaccine control	2020-2026	CSFV diagnosis and vaccine control	ARS, USDA	UNITED STATES OF AMERICA
CSFV and ASFV diagnosis	2020-2023	Improve CSFV and ASFV diagnostic tools	University of Illinois, USDA	UNITED STATES OF AMERICA

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

No

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

No

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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- Removal of the Erns RNase Activity and of the 3' Untranslated Region Polyuridine Insertion in a Low-Virulence Classical Swine Fever Virus Triggers a Cytokine Storm and Lethal Disease.

Wang M, Bohórquez JA, Muñoz-González S, Gerber M, Alberch M, Pérez-Simó M, Abad X, Liniger M, Ruggli N, Ganges L. *J Virol.* 2022 Jul 27;96(14):e0043822. doi: 10.1128/jvi.00438-22. Epub 2022 Jun 27.

- The FlagT4G Vaccine Confers a Strong and Regulated Immunity and Early Virological Protection against Classical Swine Fever.

Bohórquez JA, Wang M, Díaz I, Alberch M, Pérez-Simó M, Rosell R, Gladue DP, Borca MV, Ganges L.

Viruses. 2022 Sep 2;14(9):1954. doi: 10.3390/v14091954.

-Evolution of Swine Influenza Virus H3N2 in Vaccinated and Nonvaccinated Pigs after Previous Natural H1N1 Infection. López-Valiñas Á, Baioni L, Córdoba L, Darji A, Chiapponi C, Segalés J, Ganges L, Núñez JI.

Viruses. 2022 Sep 10;14(9):2008. doi: 10.3390/v14092008.

-The new emerging ovine pestivirus can infect pigs and confers strong protection against classical swine fever virus. Bohórquez JA, Sozzi E, Wang M, Alberch M, Abad X, Gaffuri A, Lelli D, Rosell R, Pérez LJ, Moreno A, Ganges L. *Transbound Emerg Dis.* 2022 May;69(3):1539-1555. doi: 10.1111/tbed.14119.

b) International conferences:

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-Role of the Erns RNase and the 3'UTR poly-uridine insertion to prevent the cytokine storm and classical swine fever. Miaomiao Wang, José Alejandro Bohórquez, Sara Muñoz-González, Markus Gerber, Mònica Alberch, Marta Pérez-Simó, Xavier Abad, Matthias Liniger^{4,5}, Rosa Rosell, Nicolas Ruggli and Lilianne Ganges. 14 Epizone AM, Barcelona, May 2022. Flash presentation.

-Early and Solid Protection generated by Thiverval Vaccine offers Novel Alternatives Against Classical Swine Fever Virus. Yaneysis Lamothe-Reyes, José Alejandro Bohórquez, Miaomiao Wang, Mònica Alberch, Marta Pérez-Simó, Rosa Rosell and Lilianne Ganges. 14 Epizone AM, Barcelona, May 2022. Poster presentation.

-A New Emerging Ovine Pestivirus Related to Classical Swine Fever Virus: Pathogenesis in Pregnant Ewes and Pigs. Jose A. Bohorquez, Miaomiao Wang, Enrica Sozzi, Monica Alberch, Joan Pujols, Guillermo Cantero, Xavier Abad, Alessandra Gaffuri, Davide Lelli, Rosa Rosell, Lester, J Perez, Albert Bensaid, Mariano Domingo, Ana Moreno and Lilianne Ganges. 14 Epizone AM. Barcelona, May 2022. Oral

presentation.

-FlagDIVA: A novel DIVA test for the classical swine fever FlagT4G vaccine. José Alejandro Bohórquez, Sira Defaus, Rosa Rosell, Marta Pérez-Simó, Monica Alberch, Douglas P. Gladue, Manuel V. Borca, David Andreu and Lillianne Ganges. 14 Epizone AM. Barcelona May 2022. Oral Communication.

-Abrogation of the Erns RNase activity in a low virulence classical swine fever virus reduces viral virulence. Miaomiao Wang, José Alejandro Bohórquez, Yoandry Hinojosa, Sara Muñoz-González, Marta Pérez-Simó, Mònica Alberch, Markus Gerber, Liani Coronado, Carmen Laura Perera, Matthias Liniger, Rosa Rosell, Nicolas Ruggli and Lillianne Ganges. 14 Epizone AM. Barcelona May 2022. Oral Communication.

-From the pathogenesis to the development of vaccines and diagnostic tools: Present and future against classical swine fever virus. Lillianne Ganges. Veterinary Vaccines, Nov 2022, Cuba. Plenary Lecture.

- Pathogenesis of African swine fever virus: Implication for the development of diagnostic tools. Lillianne Ganges. Veterinary Vaccines. Nov 2022. Plenary Lecture.

c) National conferences:

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- A novel dendrimeric-based strategy for the detection of the Classical swine fever FlagT4G vaccine. Lillianne Ganges. XVI Congreso Nacional de Virología SEV, Sep 2022.

- Into the eye of the classical swine fever cytokine storm: Role of the Erns RNase activity and a poly-uridine insertion in the 3'UTR. Lillianne Ganges. XVI Congreso Nacional de Virología SEV, Sep. 2022

- Pathogenesis of an emerging Pestivirus in ovine and swine: old foes or new threats?. J.A. Bohórquez, M. Wang, E. Sozzi, M. Alberch, J. Pujols, G. Cantero, X. Abad, A. Gaffuri, D. Lelli, R. Rosell, L.J. Perez, A. Bensaid M. Domingo, A. Moreno and L. Ganges

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

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-Pestivirus: Los nuevos de la clase y los viejos conocidos. Iván Díaz, Lillianne Ganges Octubre 2022. Suis 191.

- Continúan los retos del sector porcino. Neila C, Aragón V, Ganges L, Accensi F, Rodriguez F, Vilalta C, Segales L. Anaporc 2022. Anuario Anaporc 2021.

-Protegir els animals per protegir les persones - Diari ARA:

http://www.redrisa.es/redrisa---vetmasi/eventos/epizone-2022_349_130_456_0_1_in.html

-Es falso que los saltos de los virus entre especies o zoonosis "sean imposibles" y que sean "sepsis en la sangre":

https://www.ara.cat/ciencia-medi-ambient/protegir-animals-protegir-persones_1_4378306.html

<https://www.newtral.es/zoonosis-sepsis-sangre/20220603/>

<https://axoncomunicacion.net/barcelona-sera-la-sede-de-la-14a-edicion-del-congreso-anual-epizone/>

-Las palomas del Reino Unido no se están "convirtiendo en zombis", son síntomas neurológicos de un conocido virus aviar:

<https://www.newtral.es/palomas-zombis-virus/20221114/>

Finalistes de la 22a edició del premi de recerca Miquel Segura:

<https://agora.xtec.cat/insjvfoix/general/finalistes-de-la-22a-edicio-del-premi-de-recerca-miquel-segura/>

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

Yes

a) Technical visit : 0

b) Seminars : 0

c) Hands-on training courses: 0

d) Internships (>1 month) 1

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	Mexico	1

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO17025	900_LE1557.pdf	900_LE1557.pdf
ISO9001	ISO 9001-AENOR-ER-0591-2013.pdf	ISO 9001-AENOR-ER-0591-2013.pdf
GLP According to Directive 2004/9/CE	BPLI2203001CAT.pdf	BPLI2203001CAT.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Seroneutralization test (NPLA) for CSFV antibody detection and and differentiation with other Pestiviruses (IT-A4 ESE 005)	ENAC
qRT-PCR (Hoffmann et al., 2005) for CSFV RNA diagnosis (IT-A4-EPCR 132)	ENAC
Conventional RT-PCR for Pestivirus detection (IT-A4-EPCR 232)	ENAC
Virus isolation test (CSFV) (IT-A4-EVI 019) EN	ENAC
ELISA for CSFV antibody detection (IT-A4-EELS 008)	ENAC
Simultaneous detection of the Classical Swine Fever virus and African swine fever by Duplex real-time RT-PCR (IT-A4-EPCR 053)	ENAC

20. 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)

TOR9: SCIENTIFIC MEETINGS

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

Yes

NATIONAL/ INTERNATIONAL	TITLE OF EVENT	CO-ORGANISER	DATE (MM/YY)	LOCATION	NO. PARTICIPANTS
International	Epizone 14 AM	IRTA-CReSA and Epizone Committee	2022-05-18	Barcelona	300

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
Epizone	2022-05-19	Barcelona, Spain	Speaker, Bohórquez A.	A New Emerging Ovine Pestivirus Related to Classical Swine Fever Virus: Pathogenesis in Pregnant Ewes and Pigs
Epizone	2022-05-19	Barcelona, Spain	Speaker, Wang M.	Abrogation of the Erns RNase activity in a low virulence classical swine fever virus reduces viral virulence
Epizone	2022-05-20	Barcelona, Spain	Speaker, Bohórquez A.	FlagDIVA: A novel DIVA test for the Classical swine fever virus FlagT4G vaccine
Epizone	2022-05-20	Barcelona, Spain	Short communication, Wang M.	Role of the Erns RNase and the 3'UTR poly-uridine insertion to prevent the cytokine storm and classical swine fever
Epizone	2022-05-18	Barcelona, Spain	Presenting Poster, Wang M.	Role of the Erns RNase and the 3'UTR poly-uridine insertion to prevent the cytokine storm and classical swine fever
Epizone	2022-05-18	Barcelona, Spain	Presenting Poster, Rosell R.	Early and Solid Protection generated by Thiverval Vaccine offers Novel Alternatives Against Classical Swine Fever Virus
Veterinary Vaccines 2022	2022-11-28	Cuba	Speaker, Ganges L.	From the pathogenesis to the development of vaccines and diagnostic tools: Present and future against classical swine fever virus.
				- Pathogenesis of African

Veterinary Vaccines 2022	2022-11-29	Cuba	Speaker, Ganges L.	swine fever virus: Implication for the development of diagnostic tools.
XVI Congreso Nacional de Virología SEV	2022-09-08	Málaga, Spain	Speaker, Ganges L.	- Into the eye of the classical swine fever cytokine storm: Role of the Erns RNase activity and a poly-uridine insertion in the 3'UTR
XVI Congreso Nacional de Virología SEV	2022-09-09	Málaga, Spain	Speaker, Ganges L.	- A novel dendrimeric-based strategy for the detection of the Classical swine fever FlagT4G vaccine
XVI Congreso Nacional de Virología SEV	2022-09-08	Málaga, Spain	Presenting Poster, Mònica Alberch	Pathogenesis of an emerging Pestivirus in ovine and swine: old foes or new threats?

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?

Not applicable (Only WOAHP Reference Laboratory designated for the disease)

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

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	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	Participant	30	Participating CSF OIE Ref. Labs: - National Veterinary Research Institute, Pulawy, Poland -Animal Health and Veterinary Laboratories Agency, Weybridge, UK - Canadian Food Inspection Agency National Centre for Foreign Animal Disease Winnipeg, Canada -Animal Health Research Institute, Tamsui, New Taipei City, Taiwan - IRTA CReSA Bellaterra (Barcelona), Spain - Organising OIE Ref. Lab: University of Veterinary Medicine of Hannover, Department of Infectious Diseases, Institute of Virology, Hannover, German

Validation of diagnostic protocols: Real time RT-PCR, antibody ELISA	Organiser	16	
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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?

Yes

TITLE OF THE PROJECT OR CONTRACT	SCOPE	NAME(S) OF RELEVANT WOA REFERENCE LABORATORIES
Pestivirus Characterization	Update on the pathogenesis, molecular biology and immunology of Pestiviruses	WOAH Ref. Lab: University of Veterinary Medicine of Hannover, Department of WOA/EU CSF Reference Laboratory, Infectious Diseases, Institute of Virology, Hannover, Germany
Development of new diagnostic tools against CSFV and ASFV	Development of new diagnostic tools against CSFV and ASFV	CSF WOA reference laboratory of Canadian Food Inspection Agency's (CFIA) National Centre for Foreign Animal Disease (NCFAD) in Winnipeg, Manitoba

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?

Yes

Purpose for inter-laboratory test comparisons ¹	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Region(s) of participating WOA Member Countries
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enhance and harmonize the diagnosis of CSFV in the Americas
Validation of diagnostic protocols: Real time RT-qPCR, Conventional RT-PCR, Sequencing, antibody detection by ELISA and NPLA tests

Organizer

16

America

Validation of diagnostic protocols: Real time RT-qPCR, Conventional RT-PCR, Antigen ELISA, Virus Isolation, Sequencing, Virus neutralization assay antibody ELISA

Participant

28

Europe

TOR12: EXPERT CONSULTANTS

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

Yes

KIND OF CONSULTANCY	Location	SUBJECT (FACULTATIVE)
Revision and update the OIE_Terrestrial_Manual, Classical swine fever virus (infection with classical swine fever virus)	remote	Revision and update

Chapter 03.09.03		
Ad hoc Group on the evaluation of CSF status 2022	remote	Review and evaluation of country dossiers, analysis of the situation in each country, determination of the situation and preparation of reports

29. Additional comments regarding your report:

No