World Organisation for Animal Health

Linda Dixon - - UNITED_KINGDOM

WOAH Reference Laboratory Reports Activities 2024

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	African swine fever
***Address of laboratory:**	Ash Road, Pirbright Woking, Surrey, GU24 0NF
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Website:	www.pirbright.ac.uk
***Name (including Title) of Head of Laboratory (Responsible Official):**	Prof Bryan Charleston
***Name (including Title and Position) of WOAH Reference Expert:**	Dr Linda Dixon
***Which of the following defines your laboratory? Check all that apply:**	Research Institute 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	
Indirect diagnostic tests		Nationally	Internationally
Elisa	Yes	0	11
Direct diagnostic tests		Nationally	Internationally
Real Time PCR	Yes	0	15
Virus Isolation	Yes	0	

			15

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?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient WOAH Member Countries	Country of recipients
ASFV positive serum	ELISA	provided	0	12 ml	2	CHINESE TAIPEI, KOREA (DEM. PEOPLE'S. REP. OF),
ASFV GII nucleic acid	PCR	provided	100 ul	0	1	UNITED KINGDOM,
ASFV GI nucleic acid	PCR	provided	0	200 ul	1	KOREA (REP. OF),
ASFV Georgia GII	challenge	provided	0	4 ml	1	THE NETHERLANDS,
ASFV Panel of 17	challenge	provided	0	1 ml each	1	CANADA,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

No

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 WOAH Standards for the designated pathogen or disease?

No

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

No

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

No

TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

Name of WOAH Member			No. samples received for	No. samples received for

Linda Dixon - - UNITED_KINGDOM

Country seeking assistance	Date	Which diagnostic test used	provision of diagnostic support	provision of confirmatory diagnoses
HONG KONG	2024-02-04	Real Time PCR, ELISA, Haemadsorbtion	0	16
HONG KONG	2024-06-01	ELISA	0	10

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

Yes

Name of the WOAH Member Country receiving a technical consultancy	Purpose	How the advice was provided
SRI LANKA	Laboratory Diagnosis Advice	Email and Remote Call
HONG KONG	Continued discussions regarding sequence data and disease situation	Email
PHILIPPINES	Part of ongoing twinning project	Email and onsite training

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
ICRAD Project ASFVint: Decoding a virus Achilles heel: the African swine fever virus interactome	3 years	Research in support of vaccine development and understanding disease pathogenesis	France (two Anses, INRAE), Spain (INIA), Germany (FLI), Estonia, (University of Tartu)	ESTONIA FRANCE GERMANY SPAIN
EU Horizon project: VAX4ASF	4 years	Research in novel ASFV vaccine technologies	Spain (Severo Ochoa Center for Molecular Biology, Sabiotec, Anprogapor, INTERPORC, HIPRA, Zabala Innovation), Germany (Ludwig-Maximilians Universitaet Muenche), United Kingdom (The Pirbright Institute), Kenya (International Livestock Research Institute), Sweden (SVA Swedish Veterinary AgencyItaly (In3diagnostic srl), Netherlands (Wageningen Bioveterinary Research - WUR), Hungary (Institute for Wildlife Management	GERMANY HUNGARY ITALY KENYA POLAND ROMANIA SPAIN SWEDEN THE NETHERLANDS UNITED KINGDOM UNITED STATES OF AMERICA

			and Nature Conservation of MATE University, PROPHYL), Romania (Univ. of Life Sciences from Timisoara), Poland (PIWet National Veterinary Research Institut) and United States (Kansas State University).	

13. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

No

TOR6: EPIZOOLOGICAL DATA

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

Yes

If the answer is yes, please provide details of the data collected:
full genome sequences are being generated from circulating and historical strains

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:
There are projects to continue to sequence and analyse ASFV genomes from both historical and new samples. Some of the data has been published and the rest will be published as soon as available. Lynnette C Goatley, Graham L Freimanis, Chandana Tennakoon, Armanda Bastos, Livio Heath, Christopher L Netherton (2024) African swine fever virus NAM P1/95 is a mixture of genotype I and genotype VIII viruses. Microbiology Resource Announcements e0006724 https://doi.org/10.1128/mra.00067-24 Lynnette C Goatley#, Graham Freimanis#, Chandana Tennakoon#, Thomas J Foster, Mehnaz Quershi, Linda K Dixon, Carrie Batten, Jan Hendrik Forth, Abel Wade, Christopher Netherton (2024) Full genome sequence analysis of African swine fever virus isolates from Cameroon. PLoS One 19(3):e0293049 https://doi.org/10.1371/journal.pone.0293049

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:

8

1. African swine fever virus NAM P1/95 is a mixture of genotype I and genotype VIII viruses.
Goatley LC, Freimanis GL, Tennakoon C, Bastos A, Heath L, Netherton CL.

Microbiol Resour Announc. 2024 Apr 11;13(4):e0006724. doi: 10.1128/mra.00067-24. Epub 2024 Mar 25.
PMID: 38526091 Free PMC article.
2. Full genome sequence analysis of African swine fever virus isolates from Cameroon.
Goatley LC, Freimanis G, Tennakoon C, Foster TJ, Quershi M, Dixon LK, Batten C, Forth JH, Wade A, Netherton C.
PLoS One. 2024 Mar 21;19(3):e0293049. doi: 10.1371/journal.pone.0293049. eCollection 2024.
PMID: 38512923 Free PMC article. .
3. The transcriptomic insight into the differential susceptibility of African Swine Fever in inbred pigs.
Banabazi MH, Freimanis G, Goatley LC, Netherton CL, de Koning DJ.
Sci Rep. 2024 Mar 11;14(1):5944. doi: 10.1038/s41598-024-56569-2.
PMID: 38467747 Free PMC article.
4. Cell entry mechanisms of African swine fever virus.
Hooper GL, Netherton CL, Wright E.
Virology. 2024 Dec;600:110277. doi: 10.1016/j.virol.2024.110277. Epub 2024 Oct 24.
PMID: 39488059 Review.
5. Six adenoviral vectored African swine fever virus genes protect against fatal disease caused by genotype I challenge.
Portugal R, Goldswain H, Moore R, Tully M, Harris K, Corla A, Flannery J, Dixon LK, Netherton CL.
J Virol. 2024 Jul 23;98(7):e0062224. doi: 10.1128/jvi.00622-24. Epub 2024 Jul 2.
PMID: 38953377 Free PMC article.
6. From structure prediction to function: defining the domain on the African swine fever virus CD2v protein required for binding to erythrocytes.
Reis AL, Rathakrishnan A, Petrovan V, Islam M, Goatley L, Moffat K, Vuong MT, Lui Y, Davis SJ, Ikemizu S, Dixon LK.
mBio. 2024 Dec 17:e0165524. doi: 10.1128/mbio.01655-24. Online ahead of print.
PMID: 39688401
7. A rosin-functionalized plastic surface inactivates African swine fever virus.
Hemmink JD, Shroff S, Chege N, Haapakoski M, Dixon LK, Marjomäki V.
Front Vet Sci. 2024 Sep 23;11:1441697. doi: 10.3389/fvets.2024.1441697. eCollection 2024.
PMID: 39376927 Free PMC article.
8. Olesen AS; Lohse L; Accensi F; Goldswain H; Belsham GJ; Bøtner A; Netherton CL; Dixon LK; Portugal R. (2024) Inefficient Transmission of African Swine Fever Virus to Sentinel Pigs from an Environment Contaminated by ASFV-Infected Pigs under Experimental Conditions. Transboundary and Emerging Diseases DOI: 10.1155/2024/8863641

b) International conferences:

11
1. Cellular responses in British domestic pigs that survive infection with the moderately virulent African swine fever virus strain Estonia 2014. Priscilla YL Tng, Laila Al-Adwani, Sandra Blome, Christopher L Netherton. European Veterinary Immunology Workshop 2024, Dublin, 4-6th September.

2. Protective immunization against genotype I of African swine fever virus using adenovirus vectored antigens. Raquel Portugal, Priscilla Tng, Laila Al-Adwani, Linda K. Dixon, Christopher L. Netherton. European Veterinary Immunology Workshop (EVIW), Dublin, 4-6th September 2024.

3. Enhanced virus-specific T-cell responses correlate with improved performance of adenovirus vectored vaccines against genotype I African swine fever. Raquel Portugal, Priscilla Tng, Laila Al-Adwani, Linda K. Dixon, Christopher L. Netherton. EPIZONE Annual Meeting, Uppsala, 25-27th September.

4. Cross-protection induced by genotype II modified live African swine fever virus candidate vaccine(s) against genotype I but not against

genotype IX. Anusyah Rathakrishnan; Hanneke Hemmink; Sam Smith; Ana Reis; Linda Dixon. EPIZONE Annual Meeting, Uppsala, 25-27th September.

5. Developing a complement-dependant cytotoxicity assay to characterise ASFV-specific antibodies. Sian Wells, Lynnette Goatley, Christine Rollier, Chris Netherton. EPIZONE Annual Meeting, Uppsala, 25-27th September.

6. Comparison of inoculation routes with African Swine Fever Virus Georgia 2007/1. Laila Al-Adwani, Christopher L. Netherton, Priscilla Y.L. Tng. EPIZONE Annual Meeting, Uppsala, 25-27th September.

7. Antigen specific humoral responses in domestic pigs after infection with moderately virulent African swine fever virus. Laila Al-Adwani, Christopher L Netherton, Priscilla YL Tng. International Veterinary Vaccinology Network Conference 2024, Ho Chi Minh City, 9-10th November
8. African swine fever virus surveillance and control. Caribbean consortium meeting on ASFV. Kansas State University June 2024. Linda Dixon
9. African swine fever virus: Advances in knowledge of host interactions and application to disease control. Biosecurity Research Institute Fellows Lecture. Kansas State University June 2024. Linda Dixon
10. Advances in knowledge of African swine fever virus immune evasion and application to vaccine development. International Conference on Viral Immunology and Biotechnology. Harbin, PR China. August 2024.
11. African swine fever virus: Advances in knowledge of host interactions and application to disease control. The Cutting Edge of African Swine Fever Research Symposium. Tsukuba Japan, October 2024. Linda Dixon

c) National conferences:

2
1. Update on African swine fever virus vaccines and WOAH Guidelines for use. Pig Veterinary Society Bristol UK, October 2024. Linda Dixon
2. Cellular responses in British domestic pigs that survive infection with the moderately virulent African swine fever virus strain Estonia 2014. Priscilla YL Tng, Laila Al-Adwani, Sandra Blome, Christopher L Netherton. European Veterinary Immunology Workshop 2024, Dublin, 4-6th September.

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

Brian Gardner, Diptesh Kanojia, Chris Netherton, Simon Gubbins, Anjan Dutta, Gianni Lo Iacono (2024) AI-Powered Tool for Automatically Identifying Environmental Risk Factors of African Swine Fever. https://doi.org/10.17605/OSF.IO/M7JPW

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

Yes

a) Technical visit : 0

b) Seminars : 0

c) Hands-on training courses: 1

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	PHILIPPINES	5

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	4025Testing-Single (1).pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
ELISA	UKAS
ELISA (antigen)	UKAS
Real time PCR (King et al.,)	UKAS
Real time PCR (Fernandez et al.,)	UKAS

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

Yes

All our management systems are built around UK legislation, some is based on WHO and WOAH, but not directly translatable as it's updated into UK law before it's applied. All facilities have their operational risk assessment and specific activity risk assessments where required. We have a process in place for reporting incidents relating to biorisk.including an investigation process and lessons learned. There is also an inspection and audit programme which monitors compliance with Biorisk related legislation including SAPO, COSHH (where it relates to human pathogens), and GM (contained use). We are inspected by the HSE as part of a proactive intervention plan, where parts of our biorisk management system are scrutinised and sampled to check compliance and we are also visited and inspected by the National Counter Terrorism Security Office (NaCTSO) to ensure any 'dual-use' materials are being held securely.

TOR9: SCIENTIFIC MEETINGS

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

No

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

No

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

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

Yes

Linda Dixon - - UNITED_KINGDOM

24. Do you network (collaborate or share information) with other WOAH Reference Laboratories designated for the same pathogen?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
ASFV WOAH Reference Laboratory Network	Participant	7	AAHL Geelong Australia, ARC-Agric S. Africa, MRP-APHIS USA, CFIA/ACIA Canada, CAHEC PR China, UCM Spain, Pirbright UK

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH 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 WOAH Ref. Labs/ organising WOAH Ref Lab
Harmonisation of diagnostic tests for ASFV (2022/23)	participant	not privy to the information	INIA Spain

26. Did your laboratory collaborate with other WOAH Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

No

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

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

Yes

Purpose for inter-laboratory test comparisons1	**Role of your reference laboratory (organizer/participant)**	**No. participating laboratories**	**Name of the test**	**WOAH Member Countries**
Harmonization of diagnostic tests for ASFV	Participant	1	ELISA	SPAIN,
Harmonization of diagnostic tests for ASFV	participant	1	real time PcR	SPAIN,
Harmonization of diagnostic tests for ASFV	participant	1	ag ELISA	SPAIN,
Harmonization of diagnostic tests for ASFV	apsrticipant	1	HAD	SPAIN,

TOR12: EXPERT CONSULTANTS

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

Yes

Kind of consultancy	Location	Subject (facultative)
Advice review of documents	Remote	Through the WOAH ASFV ref lab network
Ad hoc working group to review ASFV vaccine chapter for BSC	Remote	Through the WOAH ASFV ref lab network

29. Additional comments regarding your report:

Yes

We continue to make our large collection of ASFV isolates and related reagents available on request.
The training visit reported in Q17 was part of this ongoing WOAH twinning project which finished in June 2024.

Since the UK left the UK we are no longer privy to full PT reports provided by the EURL and therefore we are not aware of the full number of participants. This limits our ability to answer questions 25 and 27 in full.