

WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted : 25 avril 2023 16:32

Laboratory Information

Name of disease (or topic) for which you are a designated WOA Reference Laboratory:	Rabies
Address of laboratory:	New Haw, Addlestone Surrey KT15 3NB Weybridge UNITED KINGDOM
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Website:	www.defra.gov.uk/apha
Name (including Title) of Head of Laboratory (Responsible Official):	Professor Anthony R. Fooks (PhD) - Head of WOA Reference Laboratory (Rabies)
Name (including Title and Position) of WOA Reference Expert:	Professor Anthony R. Fooks (PhD) - WOA Reference Expert (Rabies)
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
FAVN	Yes	1597	11986
Direct diagnostic tests		Nationally	Internationally
FAT	Yes	600	0

RTCIT	Yes	0	0
Real time Taqman / SYBR RT-PCR	Yes	643	0
Reverse-transcriptase Polymerase Chain	Yes	7	0

TOR2: REFERENCE MATERIAL

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

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOA 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 MEMBER COUNTRIES	COUNTRY OF RECIPIENTS
CVS-11 virus	PCR, RTCIT	Provided	0	1 ml	1	Asia and Pacific
Lyssavirus RNA on FTA cards	PCR	Provided	0	3 cards	1	Africa

4. Did your laboratory produce vaccines?

Not applicable

5. Did your laboratory supply vaccines to WOA Members?

No

TOR3: NEW PROCEDURES

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

Yes

NAME OF THE NEW TEST OR DIAGNOSTIC METHOD DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
A simplified method for measuring neutralising antibodies against rabies virus	<p>A fluorescent recombinant rabies virus was constructed using reverse genetics by inserting the gene for the mCherry fluorescent protein in front of the ribonucleoprotein gene of the SAD B-19 genome and replacing its glycoprotein with that of the Challenge Virus Standard (CVS)-11 RABV strain to ensure antigenic authenticity with the FAVN. This new recombinant virus (termed mCCCG) expressed the mCherry protein to high levels enabling direct observation of infected cells. In vitro growth kinetics of mCCCG were indistinguishable from that of CVS-11. The stability of the recombinant virus was assessed by sequencing several passages of the rescued virus and only minor changes detected.</p> <p>Comparative assessment of virus neutralisation test using mCherry producing virus (NTmCV) against using CVS-11 (FAVN) demonstrated that test results were equivalent to each other; therefore, mCCCG can be used as an alternative to CVS-11 for measuring antibody titres against the rabies virus. The use of NTmCV removes the need for expensive antibody conjugates and significantly reduces assay time. This makes the approach viable for</p>

RABV serological assessment in resource limited settings. Moreover, the reading of the plates can be completed automatically using a cell imaging reader.

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

No

TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

NAME OF WOAHP 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
ETHIOPIA	2022-03-16	FAT, RT-PCR	10	0
ETHIOPIA	2022-05-25	FAT, RT-PCR	2	0
FRANCE	2022-06-14	FAVN	44	0
ETHIOPIA	2022-09-05	FAT, RT-PCR	3	0
ETHIOPIA	2022-10-27	FAT, RT-PCR	4	0
FRANCE	2022-12-05	FAVN	44	0

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
GHANA	Technical assistance, in partnership with Mission Rabies, as part of a UK Defra-funded Animal Health Systems Strengthening Project.	Provision of technical information with a focus on education of school children and the vaccination of free-roaming dogs.
NIGERIA	Technical assistance, in partnership with the Global Alliance for Rabies Control (GARC), as part of a UK Defra-funded Animal Health Systems Strengthening Project.	Provision of technical information in support of the Stepwise Approach Towards Rabies Elimination (SARE) workshop.
SIERRA LEONE	Technical assistance for the implementation phase as part of a WOAHP-funded Twinning Project.	Provision of technical information with a focus on FAT and conventional PCR testing, SOPs and mentoring support.

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
EU-funded H2020 'European Virus Archive Global' [EVAg; https://www.european-virus-archive.com]	4-years (2020/23)	Characterisation of rabies virus isolates	~50	FRANCE
UK DEFRA-funded 'Understanding global threat of lyssaviruses' (SE0433)	4 years (2020/24)	International lyssavirus surveillance	1	NIGERIA

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:

Nationally, surveillance data from passive surveillance programmes (wild bats, zoo bats) and targeted testing (suspect animals and humans, deaths in quarantine and illegal landings) is collected. From an international perspective, whole viral genomic data is collated to inform rabies elimination programmes.

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:

National data (including positive cases) is reported to the UK Government (veterinary & public health departments) and subsequently reported to WHO (Rabies Bulletin Europe quarterly reports, Annual Zoonosis Reports), EFSA (annual reports), OIE (case/incident reports) and EU (via EURL). Data is also published in assessment reports, Science Blogs, peer-reviewed journals and at national and international conferences. A bat rabies dashboard is available, which provides information on passive surveillance activities for lyssavirus in British wild bats.

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:

6

1. Stankov et al., (2021). *History of Rabies Incidence and Rabies Control in Serbia in Support of the Zero by 2030 Campaign to Eliminate*

Dog-Mediated Human Rabies. Viruses 14; 75.

2. Walker et al., ICTV Report Consortium. (2022). ICTV Virus Taxonomy Profile: Rhabdoviridae 2022. *J Gen Virol.* 103(6). doi: 10.1099/jgv.0.001689.PMID: 35723908.

3. Müller et al., (2022). Rabies in Kudu: Revisited. *Adv Virus Res.* 112; 115-173. doi: 10.1016/bs.aivir.

4. Hu et al., (2022). Generalized modules for membrane antigens (GMMA), an outer membrane vesicle-based vaccine platform, for efficient viral antigen delivery. *Extracell Vesicles.* 11(11); e12247. doi: 10.1002/jev2.12247.

5. Kuhn et al., (2022). 2022 taxonomic update of phylum Negarnaviricots (Riboviria: Orthornavirae), including the large orgers Bunyavirales and Mononegavirales. *Arch Virol.* doi: 10.1007/s00705-022-05546-z.

6. Shipley et al., (2022). Taiwan Bat Lyssavirus: In vitro and in vivo assessment of the ability of rabies vaccines to neutralise a novel lyssavirus. *Viruses 14(12):2750.* doi: 10.3390/v14122750.

b) International conferences:

3

1. Partners for Rabies Prevention meeting, Switzerland [June 2022]

2. 16th Vaccine Congress, Riva del Garda, Italy [Sept 2022]

3. WOA / WHO Collaborating Centres and Experts on Rabies, WOA HQ, Paris, France [Dec 2022]

c) National conferences:

1

1. The Institute for Biomedical Science (IBMS), Birmingham, UK (Invited speaker) [Mar 2022]

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

1

EU-funded H2020 'European Virus Archive Global' [EVA-GLOBAL; <https://www.european-virus-archive.com>]

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 : 5

b) Seminars : 0

c) Hands-on training courses: 0

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
(a) WOA-funded Twining Project Meeting #1.	Sierra Leone	10
(a) UK Defra ODA-Funded Animal Health Systems Strengthening (AHSS) project meeting.	Ghana	5
(a) UK Defra ODA-Funded Animal Health Systems Strengthening (AHSS) project meeting.	Nigeria	8

(a) WOAH-funded Twinning Project Meeting #2.	Sierra Leone	10
(a) UK Defra ODA-Funded Animal Health Systems Strengthening (AHSS) project meeting.	Ghana	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	APHA UKAS cert to 25 Nov 25.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Fluorescent antibody virus neutralisation test (FAVN)	UKAS (ISO17025:2005)
Fluorescent antibody test (FAT)	UKAS (ISO17025:2005)
Taqman real-time RT-PCR (Real time RT-PCR)	UKAS (ISO17025:2005)
SYBR real-time RT-PCR	UKAS (ISO17025:2005)
Conventional reverse-transcriptase PCR (RT-PCR)	UKAS (ISO17025:2005)
Rabies tissue culture isolation test (RTCIT)	UKAS (ISO17025:2005)
Detection of Rabies Virus Antigen by H&E and IHC	UKAS (ISO17025:2005)

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

Yes

APHA maintains a complete and functioning laboratory biological risk management system, which ensures that the laboratory is in compliance with applicable local, national (UK Health and Safety Executive), regional, and international standards and requirements for biosafety and laboratory biosecurity.

TOR9: SCIENTIFIC MEETINGS

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

No

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

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
13th Partners for Rabies Prevention Meeting	2022-06-14	Les Pensières, Annecy, France	Delegate	Not applicable
World Rabies Day 2022	2022-09-28	Freetown, Sierra Leone	Speaker	'Role of a WOA International reference Laboratory for Rabies'

WOAH / WHO Collaborating Centres and Experts on Rabies	2022-12-12	Paris, France	Speaker	'Development of a platform to generate multi-valent vaccines against viral pathogens'
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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

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOAHP REF. LABS/ ORGANISING WOAHP REF. LAB.
OIE Rabies Laboratory (RABLAB) Network.	Participant	9	ANSES (France), CFIA (Canada), OVI (South Africa), KVI (Israel), APQA (Republic of South Korea), SENASICA (Mexico), CVRI (China), IDAH (Romania) / FLI (Germany), CDC (USA),

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.
VETQAS national rabies serology scheme (FAVN) (every 6 months)	Organiser (APHA Quality Assurance Unit Independent VETQAS organiser)	Information not available.	Confidential.
VETQAS national rabies serology scheme (FAVN) (every 6 months)	Participant	Information not available.	UK

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
Characterisation of bat lyssaviruses.	Whole genome sequencing of EBLV-1 in British bats from the UK compared with European EBLV-1 sequences.	FLI (Germany) & ANSES (France) & ANSES (France)
Characterisation of rabies virus in Kudu.	Whole genome sequencing of rabies virus isolates circulating in Kudu from Namibia compared with historical isolates from jackals and other canids from Southern Africa.	FLI (Germany)

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?

Yes

Purpose for inter-laboratory test comparisons ¹	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Region(s) of participating WOAH Member Countries
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Rabies serology scheme.

Participant

1

America

TOR12: EXPERT CONSULTANTS

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

Yes

KIND OF CONSULTANCY	Location	SUBJECT (FACULTATIVE)
Review of WOAH Standards.	Virtual / Responding to specific technical queries.	Review of the rabies chapter 3.1.18 for the WOAH Manual of Diagnostic Tests and Vaccines for Terrestrial Animals 2022.
Technical assistance.	Virtual.	Participation in the WOAH Rabies Laboratories Network (RABLAB).
Technical assistance.	In person.	Participation in the WOAH / WHO Collaborating Centres and Experts on Rabies.

29. Additional comments regarding your report:

Yes

The UK, as a non-EU member, is awaiting a decision from the European Commission in agreeing to participation of APHA in the ANSES serology proficiency panel for rabies.