

# WOAH Reference Laboratory Reports Activities 2022

## Activities in 2022

This report has been submitted : 24 avril 2023 17:33

### Laboratory Information

<b>Name of disease (or topic) for which you are a designated WOA Reference Laboratory:</b>	Bluetongue
<b>Address of laboratory:</b>	The Pirbright Institute, Ash Road, Pirbright, Woking, Surrey, UK, GU24 0NF
<b>Tel.:</b>	+441483231344
<b>E-mail address:</b>	carrie.batten@pirbright.ac.uk
<b>Website:</b>	<a href="https://www.pirbright.ac.uk/our-science/vector-borne-viral-diseases/non-vesicular-disease-reference-laboratory">https://www.pirbright.ac.uk/our-science/vector-borne-viral-diseases/non-vesicular-disease-reference-laboratory</a>
<b>Name (including Title) of Head of Laboratory (Responsible Official):</b>	Prof Bryan Charleston, Institute Director
<b>Name (including Title and Position) of WOA Reference Expert:</b>	Dr Carrie Batten, Head of the non vesicular reference laboratories
<b>Which of the following defines your laboratory? Check all that apply:</b>	Research Institute

### 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
C-ELISA	Yes	2527	1
Direct diagnostic tests		Nationally	Internationally

Real-time RT-PCR	Yes	8946	40
Virus isolation	Yes	1	3

## 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
BTV28 nucleic acid	PCR	Provide	0	100ul	1	Europe
BTV1, 2, 3, 7, 9, 15, 16, 20 and 23 nucleic acid	PCR	Provide	0	9 x 100ul	1	Asia and Pacific
BTV-8 nucleic acid	PCR	Provide	0	200ul	1	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?

No

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

No

## TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

NAME OF WOA?H MEMBER COUNTRY	DATE	WHICH DIAGNOSTIC TEST USED	NO. SAMPLES RECEIVED FOR PROVISION OF	NO. SAMPLES RECEIVED FOR PROVISION OF CONFIRMATORY
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SEEKING ASSISTANCE			DIAGNOSTIC SUPPORT	DIAGNOSES
KOSOVO	2022-03-25	Real-Time RT-PCR	0	39

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
KOSOVO	Diagnostic test selection and training	email, training visit

## 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
PALE-Blu: Understanding		<p>Full-genome sequence analyses will increase the accuracy of BTV strain distribution maps, to identify pathways and mechanisms for spread into and within Europe, as well as appropriate prevention strategies. PALE-Blu will analyse the genetic connectivity of Culicoides vector populations in different regions, as well as the movements of individual BTV lineages and genes. Together with reverse genetics technologies and infection/replication studies in new Culicoides cell lines, or adults from different Culicoides species, this will elucidate the genetic basis for geographic localisation/movement of BTV strains and serotypes. We will analyse differences in saliva proteins from Culicoides species, their ability to</p>	<p>University of Nottingham - UK; AGENCE NATIONALE DE SECURITE SANITAIRE DE L'ALIMENTATION, DE L'ENVIRONNEMENT ET DU TRAVAIL - France; CENTRE DE COOPERATION INTERNATIONALE EN RECHERCHE AGRONOMIQUE POUR LE DEVELOPPEMENT - France; ISTITUTO ZOOPROFILATTICO SPERIMENTALE DELL'ABRUZZO E DEL MOLISE "G. CAPOREALE" DI TERAMO - Italy; FRIEDRICH LOEFFLER INSTITUT - BUNDESFORSCHUNGSINSTITUT FUER TIERGESUNDHEIT - Germany; ENVIRONMENTAL RESEARCH GROUP OXFORD LIMITED - UK; UNIVERSITE LIBRE DE BRUXELLES - Belgium; INSTITUTO NACIONAL DE</p>	<p>BELGIUM FRANCE GERMANY ISRAEL ITALY KENYA MOROCCO SENEGAL</p>

pathogen, livestock, environment interactions involving bluetongue virus	5 years (closed June 2022)	modify the BTV surface proteins (proteases) and effects on efficiency of transmission (in both directions) between vertebrae hosts and insectvectors. These studies will provide a better understanding of incursion risks for different BTV strains, supporting effective control strategies. PALEBLU will explore more effective and crossserotype subunitvaccines that are DIVA assay compatible and generate a stronger immune response from a single inoculation. We will also explore the potential for use of antiviral agents to induce immediate protection post vaccination. More effective diagnostic systems to better detect mixed infections will also be developed by multiplexing existing or novel diagnostic assay systems	INVESTIGACION Y TECNOLOGIA AGRARIA Y ALIMENTARIA - Spain; STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK - Netherlands; UNIVERSITY OF GLASGOW - UK; KIMRON VETERINARY INSTITUTE - Israel; UNIVERSIDAD COMPLUTENSE DE MADRID - Spain; STATENS VETERINAERMEDICINSKA ANSTALT - Sweden; KAFKAS UNIVERSITESI - Turkey; INSTITUT AGRONOMIQUE ET VETERINAIRE HASSAN II - Morocco; THE PIRBRIGHT INSTITUTE LBG - UK; International Livestock Research Institute - Kenya; INSTITUT SENEGALAIS DE RECHERCHES AGRICOLES - Kenya; INSTITUT PASTEUR DE TUNIS - Tunisia	SPAIN SWEDEN THAILAND THE NETHERLANDS TUNISIA TURKEY UNITED KINGDOM
INFRAVEC 2	4 years (closed July 2022)	Harmonisation of vector competence studies	Institut Pasteur, Centro Agricultura E Ambiente Giorgio Nicoli SRL, Cirad, Ministere de la Sante, EMBL, FORTH, Imperial College, IRD, LSTM, Max Planck, POLO GGB, Radboud University, Tropiq Health Sciences, USTTB, University of Glasgow, University of Karlova, University of Zurich, Wageningen University	BURKINA FASO CZECH REPUBLIC FRANCE GERMANY GREECE ITALY MALI NEW CALEDONIA SENEGAL SWITZERLAND THE NETHERLANDS UNITED KINGDOM

## 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:

We characterized the BTV-4 strain from Kosovo and have submitted the genome sequence. As part of an ongoing project we are sequencing historical strains of BTV and related orbiviruses for future publication.

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:

Sequence data - submitted for publication to Transboundary and emerging diseases.

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:

1

*Christopher Sanders, Eva Veronesi, Paulina Rajko-Nenow, Peter Mertens, Carrie Batten, Simon Gubbins, Simon Carpenter, and Karin Darpel (2022). Field-reassortment of bluetongue virus illustrates plasticity of virus associated phenotypic traits in the arthropod vector and mammalian host in vivo. Journal of virology. DOI: 10.1128/jvi.00531-22*

b) International conferences:

3

*Bridging the gap: Persistence of Culicoides-borne viruses over winter in temperate regions: Entomological Society of America, Vancouver, 16th Nov 22*

*Visualization of bluetongue infection and replication in the midgut of Culicoides biting midges: Entomological Society of America, Vancouver, 16th Nov 22*

*Novel antibody signatures in Bluetongue virus-infected ruminants improve predictions of infectious timelines: 14th Epizone annual meeting, Barcelona, May 2022*

*NGS viral enrichment for BTV: 6th Congress of the European Association of Veterinary Laboratory Diagnosticians (EAVLD2022), Sevilla, Oct 24th-26th*

*Co-infection and superinfection exclusion using BTV-1 and BTV-8: Banff, Alberta, Canada, 10th - 4th Oct 2022.*

c) National conferences:

0

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

0

## TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

Yes

a) Technical visit : 1

b) Seminars :

c) Hands-on training courses:

d) Internships (> 1 month)

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	Kosovo	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/IEC 17025:2017		Pirbright UKAS testing Schedule 2022.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Real-time RT-PCR (Hoffmann et al)	UKAS
ELISA	UKAS
Virus isolation	UKAS
Real-time RT-PCR (Mann et al)	UKAS

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

Yes

The institute works to reduce biorisk across all areas of its work

## TOR9: SCIENTIFIC MEETINGS

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

No

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

No

## TOR10: NETWORK WITH WOAHA REFERENCE LABORATORIES

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

Yes

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

No

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

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOA REF. LABS/ ORGANISING WOA REF. LAB.
Harmonisation of ELISA and PCR tests for BTV	Participant	47	Organiser: Spain Participants: IZS, Italy and OVI South Africa

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
PALE-Blu: Understanding pathogen, livestock, environment interactions involving bluetongue virus	Full-genome sequence analyses will increase the accuracy of BTV strain distribution maps, to identify pathways and mechanisms for spread into and within Europe, as well as appropriate prevention strategies. PALE-Blu will analyse the genetic connectivity of Culicoides vector populations in different regions, as well as the movements of individual BTV lineages and genes. Together with reverse genetics technologies and infection/replication studies in new Culicoides cell lines, or adults from different Culicoides species, this will elucidate the genetic basis for geographic localisation/movement of BTV strains and serotypes. We will analyse differences in saliva proteins from Culicoides species, their ability to modify the BTV surface proteins (proteases) and effects on efficiency of transmission (in both directions) between vertebrate hosts and insect-vectors. These studies will provide a better understanding of incursion risks for different BTV strains, supporting effective control strategies. PALEBLU will explore more effective and cross serotype subunit vaccines that are DIVA assay compatible and generate a stronger immune response from a single inoculation. We will also explore the potential for use of antiviral agents to induce immediate protection post vaccination. More effective diagnostic systems to better detect mixed infections will also be developed by multiplexing existing or new assays.	IZS, Italy

## 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 <sup>1</sup>	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Region(s) of participating WOA Member Countries
Harmonisation of ELISA and PCR tests for BTV	Participant	47	Africa America Asia and Pacific Europe MiddleEast

## TOR12: EXPERT CONSULTANTS

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

29. Additional comments regarding your report:

Yes

*We are expecting the 2022 WOA PT organised by IZS, Italy within the next week, it is slightly delayed.*

*Training was provided to a Kosovan citizen doing a PhD in the Czech Republic.*

*The Pirbright has active orbivirus and entomological research groups, who regularly publish in high impact journals, this information is directly relevant to aspects of BTV control. Additionally the Pirbright Institute holds a large collection of BTV isolates which it makes available on request.*