OIE Reference Laboratory Reports Activities

Activities in 2021

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Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Bluetongue
Address of laboratory:	Ash Road, Pirbright Woking, Surrey, GU24 0NF UNITED KINGDOM
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Website:	https://www.pirbright.ac.uk/our-science/vector-borne-viral-diseases/non-vesicular-disease-reference-laboratory
Name (including Title) of Head of Laboratory (Responsible Official):	Prof Bryan Charleston, Institute Director
Name (including Title and Position) of OIE Reference Expert:	Dr Carrie Batten, Head of non vesicular reference laboratories
Which of the following defines your laboratory? Check all that apply:	Other: Research institute

ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards

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 OIE Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
C-ELISA	Yes	3271	9
Direct diagnostic tests		Nationally	Internationally
Real-Time RT-PCR	Yes	11562	9
Virus Isolation	Yes	1	3

ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards.
To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.

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

No

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient OIE Member Countries	Region of recipients
EHDV (BTV) ILC panel 8 x 300ul sera and 8 x 1ml EDTA	ELISA/PCR	Provide	10.4ml	31.2ml	4	☐Africa ☒Americas ☐Asia and Pacific ☒Europe ☐Middle East
7 various BTV strains	Cell culture	Provide	0	14 ml total	1	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to OIE Member Countries?

No

ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?

No

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?

No

ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

No

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

Yes

Name of the OIE Member Country receiving a technical consultancy	Purpose	How the advice was provided
CANADA	Virus isolation of BTV/EHDV methods	Email and virtual meeting
MEXICO	advice on BTV control material	Email
FRANCE	Discussions regarding ILC	Email

ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	OIE Member Countries involved other than your country
PALE-Blu: Understanding pathogen, livestock, environment interactions involving bluetongue virus	5 Years	Full-genome sequence analyses will increase the accuracy of BTVstrain 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 vertebrae 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 crossserotype subunitvaccines that are DIVA assay compatible and generate a stronger immune response from a single innoculation. 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	University of Nottingham - UK; AGENCE NATIONALE DE SECURITE SANITAIRE DE L'ALIMENTATION, DE L'ENVIRONNEMENT ET DU TRAVAIL - France; CENTRE DE COOPERATION INTERNATIONAL EN RECHERCHE AGRONOMIQUE POUR LE DEVELOPMENT - France; ISTITUTO ZOOPROFILATTICO SPERIMENTALE DELL'ABRUZZO E DEL MOLISE "G. CAPORALE" DI TERAMO - Italy; FRIEDRICH LOEFFLER INSTITUT - BUNDESFORSCHUNGSINSTITUT FUER TIERGESUNDHEIT - Germany; ENVIRONMENTAL RESEARCH GROUP OXFORD LIMITED - UK; UNIVERSITE LIBRE DE BRUXELLES - Belgium; INSTITUTO NACIONAL DE 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	BELGIUM FRANCE GERMANY ISRAEL ITALY KENYA MOROCCO SENEGAL SPAIN SWEDEN THAILAND THE NETHERLANDS TUNISIA TURKEY UNITED KINGDOM
GNAT work	3 years	Understanding the biology of vectors	London School Hygiene and Tropical Medicine, Universidade Federal do Minas Gerais, ICCDR, B	BANGLADESH BRAZIL UNITED KINGDOM
INFRAVEC 2	4 years	Harmonisation of vector competence studies	Institut Pasteur, Centro Agricoltura 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
Sharing of viral communities between individuals and groups of macaques at the wildlife-livestock-human interface	6 years	Investigation into virus diversity in Macques	University of Surrey, UK University of Columbia/UC Davis, USA plus contacts in Bangladesh	BANGLADESH UNITED KINGDOM UNITED STATES OF AMERICA
Influence of virus and host factors on the vector competence of Culicoides biting midges to Bluetongue virus	3.5 years	Investigate the influence of virus and host factors on the vector competence of Culicoides biting midges to Bluetongue virus	FLI, Germany	GERMANY

ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases

11. Did your Laboratory collect epizootiological 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 North Macedonia and published the genome sequence. As part of an ongoing project we are sequencing historical strains of BTV and related orbiviruses for future publication.

12. Did your laboratory disseminate epizootiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:
John Flannery, Simon King, Paulina Rajko-Nenow, Zagorka Popova, Kiril Krstevski, Igor Djadjovski and Carrie Batten (2021). Re-emergence of BTV serotype 4 in North Macedonia, July 2020. Transboundary and emerging diseases, 68: 220–223. DOI: 10.1111/tbed.13900

13. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category)

a) Articles published in peer-reviewed journals: 4
Development of real-time RT-qPCR assays for the typing of two novel bluetongue virus genotypes derived from sheeppox vaccine (2021). Simon King, John Flannery; Carrie Batten; Paulina Rajko-Nenow. Journal of virological methods, 298. https://doi.org/10.1016/j.jviromet.2021.114288

Serological cross-reactions between expressed VP2 proteins from different bluetongue virus serotypes (2021). Petra C. Fay, Fauziah Mohd Jaafar, Carrie Batten, Houssam Attoui, Keith Saunders, George Lomonossoff, Elizabeth Reid, Daniel Horton, Sushila Maan, David Haig, Janet Daly, Peter P. C. Mertens. Viruses, 13(8), 1455; https://doi.org/10.3390/v13081455.

Identification of a BTV-Strain-Specific Single Gene That Increases Culicoides Vector Infection Rate (2021). Honorata Ropiak, Simon King, Marc Guimera, Kerry Newbrook, Gillian Pullinger, Hannah Brown, John Flannery, Simon Gubbins, Carrie Batten, Paulina Rajko-Nenow and Karin Darpel. Viruses 2021, 13(9), 1781; https://doi.org/10.3390/v13091781

Development of a novel loop mediated isothermal amplification assay (LAMP) for the rapid detection of epizootic haemorrhagic disease virus (2021). Paulina Rajko-Nenow, Emma L A Howson, Duncan Clark, Natasha Hilton, Aruna Ambagala, Nicholas Svitek, John Flannery and Carrie Batten. Viruses 2021, 13, 2187. https://doi.org/10.3390/v13112187

b) International conferences: 0

c) National conferences: 0

d) Other:
(Provide website address or link to appropriate information) 0

ToR 7: To provide scientific and technical training for personnel from OIE Member Countries
To recommend the prescribed and alternative tests or vaccines as OIE Standards

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

No

ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned

15. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)
ISO/IEC17025	UKAS Cer 2021.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Real-time RT-PCR	UKAS
C-ELISA	UKAS
Virus isolation	UKAS

17. 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)

ToR 9: To organise and participate in scientific meetings on behalf of the OIE

18. Did your laboratory organise scientific meetings on behalf of the OIE?

No

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

No

ToR 10: To establish and maintain a network with other OIE Reference Laboratories designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results

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

Yes

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

Yes

Purpose of the proficiency tests: [1]	Role of your Reference Laboratory (organiser/ participant)	No. participants	Participating OIE Ref. Labs/ organising OIE Ref. Lab.
Harmonization of diagnostic tests	Participant	18	Organiser: IZS, Italy
Harmonisation of ELISA and PCR tests for BTV (This years also includes a VI panel)	Participant	49	Participants: IZS, Italy and OVI, South Africa

[1] *validation of a diagnostic protocol: specify the test; quality control of vaccines: specify the vaccine type, etc.*

22. Did your laboratory collaborate with other OIE 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 OIE Reference Laboratories
PALE-Blu: Understanding pathogen, livestock, environment interactions involving bluetongue virus	Full-genome sequence analyses will increase the accuracy of BTVstrain 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 vertebrae 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 crossserotype subunitvaccines that are DIVA assay compatible and generate a stronger immune response from a single innoculation. 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	IZS, Italy

ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than OIE Reference Laboratories for the same disease?

Yes

Note: See Interlaboratory test comparisons in: Laboratory Proficiency Testing at: http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing see point 1.3

Purpose for inter-laboratory test comparisons[1]	No. participating laboratories	Region(s) of participating OIE Member Countries
Harmonisation of ELISA and PCR tests for BTV (This years also includes a VI panel)	49	☒Africa ☒Americas ☒Asia and Pacific ☒Europe ☒Middle East

ToR 12: To place expert consultants at the disposal of the OIE

24. Did your laboratory place expert consultants at the disposal of the OIE?

No

25. Additional comments regarding your report: