

# OIE Reference Laboratory Reports Activities

## *Activities in 2020*

**This report has been submitted : 2021-01-18 13:52:23**

<b>Name of disease (or topic) for which you are a designated OIE Reference Laboratory:</b>	Bluetongue
<b>Address of laboratory:</b>	Ash Road, Pirbright Woking, Surrey, GU24 0NF UNITED KINGDOM
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<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>	Dr Bryan Charleston
<b>Name (including Title and Position) of OIE 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

**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	
		Nationally	Internationally
Indirect diagnostic tests		Nationally	Internationally
C-ELISA	Yes	2034	0
Direct diagnostic tests		Nationally	Internationally
Real-Time RT-PCR	Yes	12810	6
Virus Isolation	Yes	0	6

**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
BTV-8 nucleic acid	PCR	Provide	0	200ul	1	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
BTV antiserum 1-24 and 26	serological tests	Provide	0	25ml	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input checked="" type="checkbox"/> 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?

Yes

Name of OIE Member Country seeking assistance	Date (month)	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
NORTH MACEDONIA (REP. OF)	July	0	6

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
BULGARIA	Understanding the viral lineage that re emerged in the region in July 2020.	E mail
CANADA	Virus propagation methods, Neutralization tests	E mail and online meeting
AUSTRALIA	General discussion, sequencing technologies	Online meeting
NORTH MACEDONIA (REP. OF)	Confirmation of BTV	E mail and Skype

***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	3 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 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.	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. 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 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

**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:
see 12 and publication list

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:
Full genome sequence of BTV-4 North Macedonia (2020). Origins of the 2016 BTV outbreak in Cyprus using full genome analysis. Full genome analysis of a novel BTV strain isolated from commercial vaccine. Genetic analysis of BTV-8 strains suggests the resurgence of BTV-8 in France is the result of accidental release from frozen germplasm.

**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: 7

John Flannery, Simon King, Paulina Rajko-Nenow, Zagorka Popova, Kiril Krstevski, Igor Djadjovski and Carrie Batten (2020). Re-emergence of BTV serotype 4 in North Macedonia, July 2020. *Transboundary and emerging diseases*. DOI: 10.1111/tbed.13900

Katherine Grace, Christina Papadopoulou, Tobias Floyd, Rachelle Avigad, Steve Collins, Elizabeth White, Carrie Batten, John Flannery, Simon Gubbins, Simon Carpenter (2020). Risk based surveillance for bluetongue virus in cattle on the South Coast of England in 2017 and 2018. *Vet Record* doi: 10.1136/vr.106016

John Flannery, Lorraine Frost, Petra Fay, Hayley Hicks, Mark Henstock, Marcin Smreczak, Anna Orłowska, Paulina Rajko-Nenow, Karin Darpel, Carrie Batten. (2020), BTV-14 infection in sheep elicits viraemia with mild clinical symptoms, *Microorganisms*, 8 (6), 892 doi.org/10.3390/microorganisms8060892

Rajko-Nenow, P.; Christodoulou, V.; Thurston, W.; Ropiak, H.M.; Savva, S.; Brown, H.; Qureshi, M.; Alvanitopoulos, K.; Gubbins, S.; Flannery, J.; Batten, C. Origin of Bluetongue Virus Serotype 8 Outbreak in Cyprus, September 2016. *Viruses* 2020, 12, 96.

Rajko-Nenow P, Golender N, Bumbarov V, Brown H, Frost L, Darpel K, Tennakoon C, Flannery J, Batten C. 2020. Complete coding sequence of a novel bluetongue virus isolated from a commercial sheeppox vaccine. *Microbiol Resour Announc* 9:e01539-19. <https://doi.org/10.1128/MRA.01539-19>.

David J Pascall, Kyriaki Nomikou, Emmanuel Bréard, Stephan Zientara, Ana da Silva Filipe, Bernd Hoffmann, Maude Jacquot, Joshua B. Singer, Kris De Clercq, Anette Bøtner, Corinne Sailleau, Cyrille Viarouge, Carrie Batten, Giantonella Puggioni, Ciriaco Ligios, Giovanni Savini, Piet A. van Rijn, Peter PC Mertens, Roman Biek (2020) "Frozen evolution" of an RNA virus suggests accidental release as a potential cause of arbovirus reemergence. *PLoS Biol* 18(4): e3000673. <https://doi.org/10.1371/journal.pbio.3000673>

Martin Ashby, Paulina Rajko-Nenow, Carrie Batten, John Flannery. Simultaneous detection of Bluetongue virus

serotypes using xMAP technology (2020). *Microorganisms*, 8 (10), 1564; doi.org/10.3390/microorganisms8101564

b) International conferences: 0

c) National conferences: 0

d) Other:

(Provide website address or link to appropriate information) 1

<https://www.pirbright.ac.uk/news/2020/02/pirbright-determines-bluetongue-strain-and-origin-2016-cyprus-outbreak>

**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 cert.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: <sup>1</sup>	Role of your Reference Laboratory (organiser/participant)	No. participants	Participating OIE Ref. Labs/organising OIE Ref. Lab.
Harmonisation of diagnostic tests	Participant	50	Participants - Italy and South Africa
Harmonisation of diagnostic tests	Participant	19	Organising OIE ref lab - Italy

<sup>1</sup> 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 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 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.	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 <sup>1</sup>	No. participating laboratories	Region(s) of participating OIE Member Countries
Harmonisation of diagnostic tests	50	<input checked="" type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input checked="" type="checkbox"/> 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?

Yes

Kind of consultancy	Location	Subject (facultative)
Review of OIE Terrestrial Manual, ninth edition: Chapter on bluetongue	Remote	Expert review of BTV chapter

25. Additional comments regarding your report: