

OIE Reference Laboratory Reports Activities

Activities in 2020

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Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Bovine tuberculosis
Address of laboratory:	Laboratoire National de Référence Tuberculose, Unité Zoonoses Bactériennes, Laboratoire de Santé Animale de Maisons-Alfort, ANSES 14, rue Pierre et Marie Curie 94701 Maisons-Alfort Cedex France
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Name (including Title) of Head of Laboratory (Responsible Official):	Dr. Pascal BOIREAU, Head of the Animal Health Laboratory, Anses, Maisons-Alfort
Name (including Title and Position) of OIE Reference Expert:	Dr. María Laura Boschioli-Cara, Research Director, Head of the Tuberculosis National Reference Laboratory
Which of the following defines your laboratory? Check all that apply:	Governmental

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
Tuberculine batch control	yes	14	0
Serology (wild boar)	no	118	0
IFNg test (Elisa)	yes	0	48
Direct diagnostic tests		Nationally	Internationally
Culture	yes	11	0
Strain identification	yes	455	0
Spoligotyping	yes	720	0
MLVA	yes	74	0
Whole genome sequencing	yes	224	0
Molecular diagnosis	yes	1070	0

**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
Mycobacterium avium D4ER immunogen	tuberculinactivity control	Bovine Tuberculosis French National Reference Laboratory	0	25 ml	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americ as <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Plasma containingbovine IFNg	IFNg test (Elisa)	Bovine Tuberculosis French National Reference Laboratory	500 µl	8	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americ as <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Crushed lymph node spiked with titrated M. bovis	molecular diagnosis - PCR	Bovine Tuberculosis French National Reference Laboratory	1.8 ml	3	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americ as <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input 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?

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
ISRAEL	bovine tuberculosis direct diagnosis	SOPs

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
OIE Project to Replace the International Standard for Bovine Tuberculin (ISBT)	3 years	Evaluate, calibrate and validate a replacement for the OIE's International Standard for Bovine Tuberculin (ISBT)	1) World Organisation for Animal Health (OIE); Paris; France, 2) Gerencia de Laboratorios (GELAB) del Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA), Buenos Aires, Argentina 3) Anses, Unité Zoonoses Bactériennes, Laboratoire de Santé Animale, Maisons-Alfort, France 4) National Veterinary Services Laboratories, USDA, Aphis Veterinary Services, Ames, Iowa, United States 5) Animal and Plant Health Agency (APHA), Surrey, United Kingdom 6) MHRA-NIBSC, Potters Bar, United Kingdom 7) European Union Reference Laboratory for Bovine Tuberculosis, VISAVET Health Surveillance Centre, Universidad Complutense Madrid, Madrid, Spain 8) Wageningen Bioveterinary Research (WBVR), Lelystad; The Netherlands 9) DG Santé, European Commission, Bruxelles, Belgium	ARGENTINA
Innotub-Poctefa	3 years	to create a scientific network of excellence to improve the control and surveillance of tuberculosis in livestock and wildlife in the trans-Pyrenees region.	ANSES Laboratoire de Santé animale, UZB ANSES Laboratoire de la Rage et de la Faune sauvage Ecole nationale vétérinaire de Toulouse (ENVT) Institut de Recerca i Tecnologia Agroalimentàries (IRTA) Universitat Autònoma de Barcelona (UAB) Institut basque de recherche et de développement agricole (NEIKER)	SPAIN

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:

Second line analyses confirming TB outbreaks in different wild or domestic-livestock species. Genotypic characterisation of TB causative agents.

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:

The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2019. "Tuberculose bovine : bilan et évolution de la situation épidémiologique entre 2015 et 2017 en France métropolitaine." Bull Epid Santé Anim Alim "Tuberculose bovine : bilan génotypique de *M. bovis* à l'origine des foyers bovins entre 2015 et 2017 en France métropolitaine." Bull Epid Santé Anim Alim. "Tuberculose bovine : bilan de la surveillance 2015-2018 en Sologne suite à la découverte d'un sanglier infecté en 2015 dans un département indemne." Bull Epid Santé Anim Alim.

**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: 12

International:

Bianco, C., S. Lesellier, J. Barrat, C. Richomme, M. L. Boschioli, et A. Nunez. 2020. "Subclinical BCG-osis in a Captive Badger (*Meles meles*) with Lymphoma." *J Comp Pathol* 176:76-80. doi: 10.1016/j.jcpa.2020.02.009.

Branger, M., V. Loux, T. Cochard, M. L. Boschioli, F. Biet, et L. Michelet. 2020. "The complete genome sequence of *Mycobacterium bovis* Mb3601, a SB0120 spoligotype strain representative of a new clonal group." *Infect Genet Evol* 82:104309. doi: 10.1016/j.meegid.2020.104309.

Brentini, M., C. Peroz, E. Dagher, S. Labrut, O. Albaric, J. Despres, C. Tesson, P. Bourreau, S. Assie, L. Michelet, M. L. Boschioli, et C. Chartier. 2020. "Caprine nodular thelitis due to *Mycobacterium uberis*: A series of 26 cases in 11 dairy goat farms in Western France." *Preventive Veterinary Medicine* 181. doi: <https://doi.org/10.1016/j.prevetmed.2020.105060>.

Conceicao, M. L. D., E. C. Conceicao, I. P. Furlaneto, S. P. D. Silva, Aeds Guimaraes, P. Gomes, M. L. Boschioli, L. Michelet, T. A. Kohl, K. Kranzer, L. D. C. Francez, Lngc Lima, I. Portugal, J. Perdigao, et K. V. B. Lima. 2020. "Phylogenomic Perspective on a Unique *Mycobacterium bovis* Clade Dominating Bovine Tuberculosis Infections among Cattle and Buffalos in Northern Brazil." *Sci Rep* 10 (1):1747. doi: 10.1038/s41598-020-58398-5.

Michelet, L., et M. L. Boschioli. 2020. "Mycobacterium uberis Infection in the Subcutaneous Tissue of the Radius/Ulna Area of a Cow." *Microorganisms* 8 (11). doi: 10.3390/microorganisms8111701.

Michelet, L., K. de Cruz, J. Tambosco, S. Hénault, et M.L. Boschioli. 2020. "Mycobacterium microti Interferes with Bovine Tuberculosis Surveillance." *Microorganisms* 8:1850.

Richomme, C., E. Reveillaud, J. L. Moyen, P. Sabatier, K. De Cruz, L. Michelet, et M. L. Boschioli. 2020. "Mycobacterium bovis Infection in Red Foxes in Four Animal Tuberculosis Endemic Areas in France." *Microorganisms* 8 (7). doi: 10.3390/microorganisms8071070.

Santos, N., C. Richomme, T. Nunes, J. Vicente, P.C. Alves, J. de la Fuente, M. Correia-Neves, M. L. Boschioli, R. Delahay, et C. Gortázar. 2020. "Quantification of the Animal Tuberculosis Multi-Host Community Offers Insights for Control." *Pathogens* 9:421.

National:

Delavenne, C., F. Pandolfi, S. Girard, E. Reveillaud, P. Jabert, M. L. Boschioli, L. Dommergues, F. Garapin, N. Keck, F. Martin, M. Moussu, S. Philizot, J. Rivière, I. Tourette, D. Calavas, C. Dupuy, B. Dufour, et F. Chevalier. 2020. "Tuberculose bovine : bilan et évolution de la situation épidémiologique entre 2015 et 2017 en France métropolitaine." *Bull Epid Santé Anim Alim*.

Desvaux, S., E. Réveillaud, C. Richomme, M. L. Boschioli, C. Delavenne, D. Calavas, F. Chevalier, et P. Jabert. 2020. "SYLVATUB : Bilan 2015-2017 de la surveillance de la tuberculose dans la faune sauvage." *Bull Epid Santé Anim Alim*.

Michelet, L., B. Durand, et M. L. Boschioli. 2020. "Tuberculose bovine : bilan génotypique de *M. bovis* à l'origine des foyers bovins entre 2015 et 2017 en France métropolitaine." *Bull Epid Santé Anim Alim*.

Richomme, C., S. Desvaux, E. Réveillaud, A. Houchot, E. Faure, J-J. Courthial, M. L. Boschioli, et F. Chevalier. 2020. "Tuberculose bovine : bilan de la surveillance 2015-2018 en Sologne suite à la découverte d'un sanglier infecté en 2015 dans un département indemne." *Bull Epid Santé Anim Alim*.

b) International conferences: 4

Charles, C. 2020. "PEMbo 3MT pitch." communication orale avec acte OHEJP ASM 2020, Virtual, 27-29 May. (oral communication)

Charles, C., L. Michelet, C. Conde, M. Branger, T. Cochard, F. Biet, et M. L. Boschioli. 2020. "Occurrence of variable insertion sites and copy numbers of IS6110 in genomes of *Mycobacterium bovis* field strains reveal high disparity among different genetic families." OHEJP ASM 2020, Virtual, 27-29 May. (poster)

Boschioli, M. L. 2020. "Actualités sur la tuberculose animale en France : situation épidémiologique et nouvelles mesures dans le plan de lutte nationale." Symposium de Santé Animale, virtuelle, 22 September 2020 (invited speaker).

Boschioli, M. L. 2020. "Tackling zoonotic tuberculosis through animal disease control: The French experience." 51st Union World Conference on Lung Health virtuelle, 20-24 October 2020 (invited speaker)

c) National conferences: 2

Canini, L., et L. Michelet. 2020. "Epidémiologie moléculaire de la tuberculose bovine – Rôle de la faune sauvage et des bovins dans la transmission en Dordogne." JSDA2020, 4 September 2020 (oral communication)

Michelet, L. 2020. "Investigation of *Mycobacterium bovis* infection in a deer-borne transmission network." JSDA2020, 3 September 2020 (oral communication)

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 17025	1-2246.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Culture	COFRAC

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?

No

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
OIE Project to Replace the International Standard for Bovine Tuberculin (ISBT)	Evaluate, calibrate and validate a replacement for the OIE's International Standard for Bovine Tuberculin (ISBT)	Argentina United Kingdom

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
Culture and PCR (participant)	report in process	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
IFNg test (participant)	report in process	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input 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?

No

25. Additional comments regarding your report:

