WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted : 24 avril 2023 15:17

Laboratory Information

Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:	Mammalian 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
Tel.:	+33149771321
E-mail address:	maria-laura.boschiroli@anses.fr
Website:	https://www.anses.fr/fr
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 WOAH Reference Expert:	Dr. María Laura Boschiroli-Cara, Research Director, Head of the Tuberculosis National Reference Laboratory
Which of the following defines your laboratory? Check all that apply:	Governmental Research agency

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 WOAH Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
Tuberculine batch control	YES	2	0

Serology (Suidae)	NO	38	0
IFNg test	YES	28	0
Direct diagnostic tests		Nationally	Internationally
Culture	YES	18	0
Strain identification	YES	570	0
Spoligotying	YES	558	0
MLVA	YES	168	0
Whole genome sequencing	YES	384	0
Molecular diagnosis	YES	2766	0

TOR2: REFERENCE MATERIAL

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

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members?

Yes

TYPE OF REAGENT AVAILABLE	RELATED DIAGNOSTIC TEST	PRODUCED/ PROVIDE	AMOUNT SUPPLIED NATIONALLY (ML, MG)	AMOUNT SUPPLIED INTERNATIONALLY (ML, MG)	NO. OF RECIPIENT WOAH MEMBER COUNTRIES	COUNTRY OF RECIPIENTS
Plasma containing bovine IFNg	IFNg test (Elisa)	Bovine tuberculosis national reference laboratory	33 units (1 ml each)	0	1	Europe
Crushed lymph node spiked with titrated M. bovis	molecula diagnosis-PCR	Bovine tuberculosis national reference laboratory	7 units (1,8 ml each)	0	1	Europe
Lyophilised TB positive Suidae serum	Serology (Elisa)	Bovine tuberculosis national reference laboratory	14 units	0	1	Europe
Infected suidae blood-soaked filter papers	Serology (Elisa)	Bovine tuberculosis national reference laboratory	20 units	0	1	Europe

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

No

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 WOAH 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 WOAH Standards for the designated pathogen or disease?

No

TOR4: DIAGNOSTIC TESTING FACILITIES

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

No

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

Yes

NAME OF THE WOAH MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY	PURPOSE	HOW THE ADVICE WAS PROVIDED
BELGIUM	IGRA test (SOP)	Advice expertise (SOP)
MOROCCO	TB diagnostics (direct-indirect) and genotyping	Advice expertise (SOP)
UNITED KINGDOM	TB direct diagnostics	Advice expertise (SOP)
CONGO (REP. OF THE)	TB diagnostics (direct-indirect)	Advice expertise (SOP)

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
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, 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
		Provision of support to EFSA and to ECDC in the		

Consortium ZOE - Zoonoses under a One health perspective in the EU	4 years	production of the EU One Health Zoonoses report and in related zoonoses online interactive data visualisation dashboards and zoonoses story maps	ISZ-ISS	ITALY

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

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:
The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2021. Surveillance de la tuberculose due à Mycobacterium bovis en France métropolitaine en 2019 : résultats et indicateurs de fonctionnement. Bulletin Epidémiologique Santé Animale Alimentation

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

Canini, L., G. Modenesi, A. Courcoul, M. L. Boschiroli, B. Durand, and L. Michelet. 2022. "Deciphering the role of host species for two Mycobacterium bovis genotypes from the European 3 clonal complex circulation within a cattle-badger-wild boar multihost system." MicrobiologyOpen 12: e1331. https://doi.org/https://doi.org/10.1002/mbo3.1331

Charles, C., C. Conde, F. Biet, M. L. Boschiroli, and L. Michelet. 2022. "IS6110 Copy Number in Multi-Host Mycobacterium bovis Strains Circulating in Bovine Tuberculosis Endemic French Regions." Front Microbiol 13: 891902. https://doi.org/10.3389/fmicb.2022.891902.

Duault, H., L. Michelet, M. L. Boschiroli, B. Durand, and L. Canini. 2022. "A Bayesian evolutionary model towards understanding wildlife contribution to F4-family Mycobacterium bovis transmission in the South-West of France." Vet Res 53 (1): 28. https://doi.org/10.1186/s13567-022-01044-x.

Richomme, C., S. Lesellier, F. J. Salguero, J. L. Barrat, J. M. Boucher, J. D. Reyes-Reyes, S. Henault, K. De Cruz, J. Tambosco, L. Michelet, J. Boutet, R. Elahi, K. P. Lyashchenko, C. O'Halloran, A. Balseiro, and M. L. Boschiroli. 2022. "Experimental Infection of Captive Red Foxes

(Vulpes vulpes) with Mycobacterium bovis." Microorganisms 10 (2). https://doi.org/10.3390/microorganisms10020380.

Sridhara, A. A., A. Johnathan-Lee, R. Elahi, P. Lambotte, J. Esfandiari, M. L. Boschiroli, T. J. Kerr, M. A. Miller, T. Holder, G. Jones, H. M. Vordermeier, B. N. Marpe, T. C. Thacker, M. V. Palmer, W. R. Waters, and K. P. Lyashchenko. 2022. "Differential detection of IgM and IgG antibodies to chimeric antigens in bovine tuberculosis." Vet Immunol Immunopathol 253: 110499. https://doi.org/10.1016/j.vetimm.2022.110499.

Vidal, E., J. Burgaya, L. Michelet, C. Arrieta-Villegas, G. Cantero, K. de Cruz, J. Tambosco, M. Di Bari, N. Romolo, M. L. Boschiroli, and B. Perez de Val. 2022. "Experimental Mycobacterium microti Infection in Bank Voles (Myodes glareolus)." Microorganisms 10 (1). https://doi.org/10.3390/microorganisms10010135.

Delavenne, C., S. Desvaux, M. L. Boschiroli, S. Carles, B. Durand, C. Forfait, K. Gache, F. Garapin, S. Girard, N. Keck, J-L. Moyen, A. Pieus, E. Réveillaud, C. Richomme, J. Rivière, C. Dupuy, and F. Chevalier. 2021. "Surveillance de la tuberculose due à Mycobacterium bovis en France métropolitaine en 2019 : résultats et indicateurs de fonctionnement." Bull. épid. santé anim. alim. 94 (13): 1-23.

b) International conferences:

15

Adriaensen, H., C. Richomme, M. L. Boschiroli, J. Salguero, V. Wacheux et S. Lesellier. 2022. "Objective quantification of TB lesions volume by MRI applicable to vaccine badger studies " 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Buendia, AG., B. Romero, J. Bezos, F. Lozano, C. Vinolo, JL Saez, I. Archetti, M. L. Boschiroli, E. Gutu, N. Karaoulani, L. de Juan et J. Alvarez. 2022. "IFN-γ assay for granting and maintenance of officially tuberculosis-free herd status and movement of cattle within the EU." 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Canini, L., G. Modenesi, A. Courcoul, M. L. Boschiroli, B. Durand et L. Michelet. 2022. "Deciphering the role of host species in two Mycobacterium bovis genotypes circulation within a cattle-badger-wildboar multi-hosts system." 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Charles, C., L. Michelet, C. Conde, F. Biet et M. L. Boschiroli. 2022. "Occurrence of IS6110 copies in genomes of field strains of Mycobacterium bovis revealed high disparity among genetic family." 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Charles, C. , L. Michelet, F. Vorimore, C. Conde, T. Cochard, F. Biet et M. L. Boschiroli. 2022. "New Mycobacterium bovis complete genomes of different clonal complexes to improve molecular epidemiology of french field strains." congrès OHEJPASM2022.

Charles, C., L. Michelet, F. Vorimore, C. Conde, T. Cochard, F. Biet et M. L. Boschiroli. 2022. "New reference genomes of Mycobacterium bovis adapted to French genotype diversity " 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Hewinson, G., B. Alonso, M. L. Boschiroli, A. Caminiti, R. Caspel, S. Edwards, MM. Ho, L. de Juan, A. Koets, J. van der Goot, V. Kapur, M. Vordermeier, S. Forcella, P. Dandapat, S. Gebredufa et G. Gifford. 2022. "One health and bovine tuberculosis : the long and winding road." 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Lesellier, S., J. Salguero, M. L. Boschiroli, J. Barrat, S. Rahou, J-M. Boucher, N. Lauterkorn, M. Barral et C. Richomme. 2022. "Intra-tracheal TB ferret model – pathogenicity and immunogenicity compared with badgers." 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Michelet, L., T. Cochard, F. Biet et M. L. Boschiroli. 2022. "A SNP-MLST method to decipher the genetic diversity of French Mycobacterium bovis strains of animal origin." 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Michelet, L., S. Solanas, A. Hartmann et M. L. Boschiroli. 2022. "Identification of environmental mycobacteria that can interfere in the ante mortem diagnosis of bovine tuberculosis." 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Remot, A., F. Carreras, E. Doz-Deblauwe, M. L. Boschiroli, J. Browne, S. Gordon et N. Winter. 2022. "Precision scut lung slices infection reveals type 1 interferon pathway is induced by Mycobacterium bovis but not M. tuberculosis." 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Sevilla, IA., M. Fuertes, MV. Geijo, B. Pérez de Val, L. Michelet, M. L. Boschiroli, A. Gomez-Buendia, J. Bezos, G. Jones, M. Vordermeier, RA. Juste et JM. Garrido. 2022. "Skin test reactions to different antigens in Guinea pigs sensitized with non-tuberculous and tuberculous mycobacteria." communication affichée 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022.

Invited:
Boschiroli, M. L. 2022. "Bovine tuberculosis control in a disease-free country, France: does the long and winding road really lead to eradication?" 7th International conference on Mycobacterium bovis, Galway, Irlande, 7-10 juin 2022 .

Boschiroli, M. L. 2022. "Tuberculosis en la fauna silvestre y animales domésticos en el sur de Francia. Transmissió de la tuberculosi entre la fauna silvestre i els animals domèstics." Jornadas PATT (Plan Anual de Transferencia Tecnológica), 06/05/22.

Boschiroli, M. L. 2022. "Programa de erradicación de tuberculosis bovina en Francia." Acto final del primero proyecto de la red Innotub, Barcelona, Spain, 31/05/22.

c) National conferences:

2
Canini, L., B. Durand, H. Duault, ML. Boschiroli et L. Michelet. 2022. "Modélisation de la transmission de Mycobacterium bovis entre animaux domestiques et sauvages : comparaison de trois zones d'endémie." Communication orale avec acte Journées de l'AEEMA, Maisons-Alfort, 13/05/22.
Charles, C. 2022. "New Mycobacterium bovis complete genomes of different clonal complexes to improve molecular epidemiology studies of French field strains." communication orale avec acte Journées ABIES.

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

pHD Thesis (1)
Charles, C. 2022. « Acquisition de nouvelles connaissances génétiques sur les souches de Mycobacterium bovis, circulant en France, par l'approche du séquençage du génome complet ». Doctorat, Université Paris-Est Sup – Thèse d'Université.

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

No

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	1-2246 (1).pdf	1-2246 (1).pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
PCR	COFRAC
Bacteriology	COFRAC

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

Yes

A biorisk department is in place in our institution. Our lab follows the guidelines layed out by the local biorisk manager, which in turn are based on WHO's Laboratory biosafety guidelines and those for "highly dangerous pathogens" issued from French regulations.

TOR9: SCIENTIFIC MEETINGS

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

No

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

No

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

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

Yes

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

No

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

No

26. Did your laboratory collaborate with other WOAH 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 WOAH REFERENCE LABORATORIES
OIE Project to Replace the International Standard for Bovine Tuberculin (ISBT)	Evaluate, calibrate and validate a replacement for the OIE's International Standar for Bovine Tuberculin (ISBT)	Argentina, United Kingdom

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	Role of your reference	No. participating	Region(s) of

comparisons1	laboratory (organizer/participant)	laboratories	participating WOAH Member Countries
Serodiagnosis of TB in suidae (ORGANISER)	organiser	14	Europe
Interferon gamma test (Elisa)	organiser	16	Europe
Interferon gamma test (Elisa)	participant	14	Europe
Bacteriology/PCR	participant	27	Europe

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

No