

WOAH Reference Laboratory Reports Activities 2023

Activities in 2023

This report has been submitted : 10 juin 2024 19:01

Laboratory Information

Name of disease (or topic) for which you are a designated WOAHO 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
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Name (including Title) of Head of Laboratory (Responsible Official):	Dr. Stéphan ZIENTARA, Head of the Animal Health Laboratory, Anses, Maisons- Alfort
Name (including Title and Position) of WOAHO 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

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 WOAHO Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests			
Serology (Suidae)		23	0
IGRA (IFNg test)		40	0
Tuberculin batch control		2	2
Direct diagnostic tests			
Culture		350	0
Mycobacterium strain identification		515	0
Soligotyping		60	0
MLVA		216	0
Whole genome sequencing		384	0
Molecular diagnosis		1233	0

TOR2: REFERENCE MATERIAL

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

No

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

Yes

TYPE OF REAGENT AVAILABLE	RELATED DIAGNOSTIC TEST	PRODUCED/ PROVIDE	AMOUNT SUPPLIED NATIONALLY (ML, MG)	AMOUNT SUPPLIED INTERNATIONALLY (ML, MG)	NO. OF RECIPIENT WOAHP MEMBER COUNTRIES	COUNTRY OF RECIPIENTS
Plasma containing bovine IFNg	IFNg test (Elisa)	Bovine tuberculosis national reference laboratory	11 units (1 ml each)	0	1	FRANCE,
Crushed lymph node spiked with titrated M. bovis	molecular diagnosis-PCR	Bovine tuberculosis national reference laboratory	20 units (1,8 ml each)	0	1	FRANCE,
Lyophilised TB positive Suidae serum	Serology (Elisa)	Bovine tuberculosis national reference laboratory	12 units	1 unit	2	FRANCE, GERMANY,
Infected suidae blood-soaked filter papers	Serology (Elisa)	Bovine tuberculosis national reference laboratory	350 units	0	1	FRANCE,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAHP 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 WOAHP 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 WOAHP Standards for the designated pathogen or disease?

No

TOR4: DIAGNOSTIC TESTING FACILITIES

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

No

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

Yes

NAME OF THE WOAHP MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY	PURPOSE	HOW THE ADVICE WAS PROVIDED
MOROCCO	TB diagnostics (direct-indirect) and genotyping	Advice expertise (SOP)
MADAGASCAR	TB diagnostics (direct-indirect)	Advice expertise (SOP)
GERMANY	TB diagnostics (indirect)	Advice expertise (SOP)
PORTUGAL	TB diagnostics (direct-indirect)	Advice expertise (SOP)
BRAZIL	BSL3 disinfection procedure	Advice expertise (SOP)
UNITED KINGDOM	TB diagnostics (direct-indirect)	Advice expertise (SOP)
BELGIUM	TB diagnostics (indirect)	Advice expertise

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAHP Members other than the own?

No

13. In exercising your activities, have you identified any regulatory research needs* relevant for WOAHP?

Yes

Research need : 1

Please type the Research need: - Creation of new standards with regards indirect diagnostic tests: absence of standards with regards TB serology or IGRA. -

Validation of synthetic tuberculin at a global scale (different epidemiological and breeding contexts).

Relevance for WOAH Disease Control, Standard Setting, Facilitation of international collaboration,

Relevance for the Codes or Manual Code, Manual,

Field Epidemiology and Surveillance, Diagnostics,

Animal Category Terrestrial,

Disease:

Mammalian tuberculosis

Kind of disease (Zoonosis, Transboundary diseases) Zoonosis, Transboundary diseases,

If any, please specify relevance for Codes or Manual, chapter and title

(e.g. Terrestrial Manual Chapter 2.3.5 - Minimum requirements for aseptic production in vaccine manufacture)

Answer:

Notes:

Answer:

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. Genotypic 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 2022.
Surveillance de la tuberculose due à Mycobacterium bovis en France métropolitaine en 2020 : 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:

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Appegren, A., M. L. Boschioli, K. De Cruz, L. Michelet, G. Hery-Arnaud, M. Kempf, P. Lanotte, P. Bemmer, O. Peuchant, M. Pestel-Caron, S. Skalli, L. Brasme, C. Martin, C. Enault, A. Carricajo, H. Guet-Revillet, M. Ponsoda, V. Jacomo, A. Bourgoin, S. Trombert-Paolantoni, C. Carriere, C. Dupont, G. Conquet, L. Galal, A. L. Banuls et S. Godreuil. 2023. "Genetic Diversity and Population Structure of Mycobacterium bovis at the Human-Animal-Ecosystem Interface in France: "A One Health Approach"." Pathogens 12 (4). <https://doi.org/10.3390/pathogens12040548>.

Boschioli, M. L. 2023. "Animal tuberculosis control in a disease-free country, France: does the long and winding road really lead to eradication?" Ir Vet J 76 (Suppl 1): 25. <https://doi.org/10.1186/s13620-023-00258-5>.

Bouchez-Zacria, M., S. Ruetter, C. Richomme, S. Lesellier, A. Payne, M. L. Boschioli, A. Courcoul et B. Durand. 2023. "Analysis of a multi-type resurgence of Mycobacterium bovis in cattle and badgers in Southwest France, 2007-2019." Vet Res 54 (1): 41. <https://doi.org/10.1186/s13567-023-01168-8>.

Bouchez-Zacria M., A., Payne, S. Girard, C Richomme, M. L. Boschioli, M. Marsot, B. Durand et S. Desvaux. 2023. "Spatial association of Mycobacterium bovis infection in cattle and badgers at the pasture interface in an endemic area in France". Prev Vet Med. 220:106044. <https://doi.org/10.1016/j.prevetmed.2023.106044>.

Charles, C., C. Conde, F. Vorimore, T. Cochard, L. Michelet, M. L. Boschioli et F. Biet. 2023. "Features of Mycobacterium bovis Complete Genomes Belonging to 5 Different Lineages." Microorganisms 11 (1). <https://doi.org/10.3390/microorganisms11010177>.

Fernandez-Veiga, L., M. Fuertes, M. V. Geijo, B. Perez de Val, E. Vidal, L. Michelet, M. L. Boschioli, A. Gomez-Buendia, J. Bezos, G. J. Jones, M. Vordermeier, R. A. Juste, J. M. Garrido et I. A. Sevilla. 2023. "Differences in skin test reactions to official and defined antigens in guinea pigs exposed to non-tuberculous and tuberculous bacteria." *Sci Rep* 13 (1): 2936. <https://doi.org/10.1038/s41598-023-30147-4>.

Gomez-Buendia, A., B. Romero, J. Bezos, J. L. Saez, I. Archetti, M. L. Pacciarini, M. L. Boschioli, S. Girard, E. Gutu, F. Barbuceanu, O. Karaoulani, A. Stournara, L. de Juan et J. Alvarez. 2023. "Evaluation of the performance of the IFN-gamma release assay in bovine tuberculosis free herds from five European countries." *Vet Res* 54 (1): 55. <https://doi.org/10.1186/s13567-023-01187-5>.

Michelet, L., J. Tambosco, F. Biet, P. Fach, S. Delannoy et M. L. Boschioli. 2023. "Deciphering the evolution of the temporal and geographic distribution of French *Mycobacterium bovis* genotypes using a high throughput SNP-targeted amplicon sequencing method." *Infect Genet Evol* 114: 105497. <https://doi.org/10.1016/j.meegid.2023.105497>.

Forfait, C., M. L. Boschioli, S. Carles, P. Chaigneau, B. Dufour, C. Dupuy, B. Durand, K. Gache, F. Garapin, J. Jachacz, N. Keck, M. Moussu, S. Philizot, A. Pieus, T. Rambaud, JF. Ravise, E. Réveillaud, C. Richomme, J. Rivière, F. Chevalier et S. Desvaux. 2022. "Surveillance de la tuberculose due à *Mycobacterium bovis* en France métropolitaine pour la campagne 2019-2020 : résultats et indicateurs de fonctionnement." *Bulletin épidémiologique, santé animale et alimentation* 97 (Special MRE).

b) International conferences:

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Boschioli, M. L., N. Keck, E. Gueneau et J-L. Moyen. 2023. "The history of a successful diagnostic tool for bovine tuberculosis detection and control in France: the IFN-γ test." *International Symposium of the World Association of Veterinary Laboratory Diagnosticians (ISWALVD 2023), Lyon, France, 29/06 au 01/07/23*.

Michelet, L., L. Canini, B. Durand et M. L. Boschioli. 2023. "Contribution of whole genome sequencing of *Mycobacterium bovis* strains for epidemiological monitoring and surveillance of bovine tuberculosis in France." *International Symposium of the World Association of Veterinary Laboratory Diagnosticians (ISWALVD 2023), Lyon, France, 29/06 au 01/07/23*.

Boschioli, M. L., "It's not always *Mycobacterium bovis*! Other *Mycobacteria* and their relevance in the veterinary field." *World Tuberculosis Day -WEBINAR European Association of Veterinary Laboratory Diagnosticians (EAVLD), 24/03/23*

c) National conferences:

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

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Boschioli, M. L. 2023. *Demande d'appui scientifique et technique relatif aux modalités de surveillance et de lutte contre l'infection par le complexe *Mycobacterium tuberculosis* des cheptels caprins en Corse. NOTE n°2023-AST-0130 (<https://www.anses.fr/fr/system/files/LABO2023AST0130.pdf>)*

Michelet, L. 2023. "Approches moléculaires au service de la compréhension de l'évolution des pathogènes : du ténia aux mycobactéries." *Habilitation à diriger des recherches HDR, Université Paris-Est*.

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAHA 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	Portée détaillée v.46 de l'attestation N° 1-2246	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 WOAHP?

No

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

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
MASTERCLASSE TB, L'initiative, Expertise France	2023-12-04	Yaoundé, Cameroon	speaker, member of the teaching staff	Tuberculose zoonotique

TOR10: NETWORK WITH WOAHP REFERENCE LABORATORIES

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

Yes

24. Do you network (collaborate or share information) with other WOAHP Reference Laboratories designated for the same pathogen?

No

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

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOAHP REF. LABS/ ORGANISING WOAHP REF. LAB.
Molecular characterization of MTBC	participant	unknown	Europe
Bacteriology and PCR	organiser	19	Europe

26. Did your laboratory collaborate with other WOAHP 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 WOAHP REFERENCE LABORATORIES
OIE Project to Replace the International Standard for Avian and Bovine Tuberculin (ISBT)	Evaluate, calibrate and validate a replacement for the International Standard for Bovine (ISBT) and Avian (ISAT) Tuberculin	Argentina, United Kingdom, Spain, United States

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAHP Reference Laboratories for the same pathogen?

Yes

Purpose for inter-laboratory test comparisons ¹	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the Test	WOAHP Member Countries
Bacteriology and PCR	Organiser	19	Bacteriology and PCR	FRANCE,

TOR12: EXPERT CONSULTANTS

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

Yes

KIND OF CONSULTANCY	Location	SUBJECT (FACULTATIVE)
ad hoc Group meetings for ISAT and ISBT replacement	WOAH headquarters	-

29. Additional comments regarding your report:

No

no comments