World Organisation for Animal Health

Paula Ristow - - THE_NETHERLANDS

WOAH Reference Laboratory Reports Activities 2025

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Leptospirosis
***Address of laboratory:**	Reference Laboratory for Leptospirosis, Amsterdam University Medical Center, Department of Medical Microbiology and Infection Prevention, Meibergdreef 39. 1105 AZ Amsterdam, The Netherlands
***Tel:**	+31205665431
***E-mail address:**	p.ristow@amsterdamumc.nl
Website:	https://leptospira.amsterdamumc.org/
***Name (including Title) of Head of Laboratory (Responsible Official):**	Paula Carvalhal Lage von Buettner Ristow, PhD, Assistant Professor
***Name (including Title and Position) of WOAH Reference Expert:**	Paula Carvalhal Lage von Buettner Ristow, PhD
***Which of the following defines your laboratory? Check all that apply:**	Academic institution

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
Microscopic Agglutination Test (MAT)	Yes	71	106
Direct diagnostic tests		Nationally	Internationally
Bacteriological culture	Yes	4	0
Real-time PCR	Yes	5	205

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
						ARGENTINA, AUSTRALIA, BELGIUM, ESTONIA, FINLAND, FRANCE, GERMANY,

Rabbit antisera anti-Leptospira	Microscopic Agglutination Test	PRODUCED/ PROVIDED	0	295 mL	17	HUNGARY, ITALY, NEW CALEDONIA, NEW ZEALAND, SERBIA, SPAIN, SRI LANKA, SWITZERLAND, TURKEY, UKRAINE,
Monoclonal antibodies anti-Leptospira	Microscopic Agglutination Test	PRODUCED/ PROVIDED	0	5 mL	2	GHANA, ITALY,
Strains	Microscopic Agglutination Test	PRODUCED/ PROVIDED	1 mL	260 mL	21	ARGENTINA, AUSTRALIA, CHILE, CZECH REPUBLIC, ECUADOR, ESTONIA, FINLAND, FRANCE, GERMANY, ITALY, JAPAN, MALAYSIA, NEW CALEDONIA, NORWAY, PORTUGAL, SERBIA, SPAIN, THAILAND, TURKEY, UNITED KINGDOM,
Culture media	Cultivating strains	PRODUCED/ PROVIDED	0	54850 mL	6	COSTA RICA, CZECH REPUBLIC, FRANCE, TURKEY, UNITED KINGDOM,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

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?

9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease?

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?

No

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
Epidemiology of leptospirosis in Indonesia	4 years	Study the circulating serovars and disease burden	BRIN	INDONESIA
Biofilm structure and omics	5 years	Study molecular mechanisms of biofilm formation and biofilm	UFBA, UFMG	BRAZIL UNITED STATES OF

		architecture		AMERICA
Leptospira genomics and leptospirosis eco-epidemiology	5 years	Study Leptospira genomics and eco-epidemiology of leptospirosis	UFBA, UFMG, USDA, University of Gottingen	BRAZIL GERMANY UNITED STATES OF AMERICA
Leptospirosis in small animals	5 years	Study leptospirosis in small companion animals	LMU Minich	GERMANY

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

No

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:
Ongoing research collaborations on outbreaks of leptospirosis in Zoo animals and on small animals.

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

No

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:

7

1

Obels, I., Mughini-Gras, L., Maas, M., Brandwagt, D., van den Berge, N., Notermans, D. W., ... E. v. Elzakker & Pijnacker, R. (2025). Increased incidence of human leptospirosis and the effect of temperature and precipitation, the Netherlands, 2005 to 2023. Eurosurveillance, 30(15), 2400611.

2

Cuenca, P. R., Souza, F. N., do Nascimento, R. C., da Silva, A. G., Eyre, M. T., Santana, J. O., ... & Giorgi, E. (2025). Using step selection functions to analyze human mobility using telemetry data in infectious disease epidemiology: a case study of leptospirosis. Elife, 14, RP107153.

3

Hamond, C., Tibbs-Cortes, B., Fernandes, L. G., LeCount, K., Putz, E. J., Anderson, T., ... & Nally, J. E. (2025). Leptospira gorisiae sp. nov, L. cinconiae sp. nov, L. mgodei sp. nov, L. milleri sp. nov and L. iowaensis sp. nov: five new species isolated from water sources in the Midwestern United States. International Journal of Systematic and Evolutionary Microbiology, 75(1), 006595.

4

Handayani, F. D., Novipuspitasari, L., Ahmed, A., Safari, D., Hidajat, M. C., Soebandrio, A., & Gasem, M. H. (2025). Detection of Pathogenic Leptospira in Sputum of Leptospirosis Patient with Pulmonary Hemorrhage. Journal of Biomedicine and Translational Research, 11(2), 54-59.

5

Hamond, C., Stone, N. E., Putz, E. J., Fernandes, L. G., Anderson, T., Camp, P., ... & Nally, J. E. (2025). Bull urine and semen as potential vectors of disease transmission for Leptospira borgpetersenii serovar Hardjo. Journal of Dairy Science.

6

Schmitt, K. G., Bergmann, M., van der Linden, H., Ahmed, A. A., Straubinger, R. K., Zablotski, Y., & Hartmann, K. (2025). Presence of Vaccine-Induced Antibodies Against Leptospira spp. Complicates the Diagnosis of Leptospirosis by the Microscopic Agglutination Test. Vaccines, 13(9), 956.

7

Schmitt, K. G., Bergmann, M., Van Der Linden, H., Ahmed, A. A., Straubinger, R. K., Zablotski, Y., & Hartmann, K. (2025). Five Leptospira spp. Antibody Point-of-Care Tests in Healthy Dogs Reveal Different Results After Revaccination Against Leptospirosis. Microorganisms, 13(11), 2604.

b) International conferences:

1

Ristow, P. "Unraveling the Complexity of Leptospirosis: Epidemiology, Pathogenesis, and Biofilm Biology in a Changing World". Seminars of Pharmaceutical Sciences. Federal Univesity of Juiz de Fora. Juiz de Fora, Minas Gerais, Brazil, 2025.

c) National conferences:

6
1
Ristow, P. "Unraveling the Complexity of Leptospirosis: Epidemiology, Pathogenesis, and Biofilm Biology in a Changing World". Seminars of the Medical Microbiology Department, Amsterdam University Medical Center, Amsterdam, The Netherlands, 2025.
2
Evaluation of Leptospira VirClia IgM Monotest for the Diagnosis of Human Leptospirosis Emma M. de Koff, Manon C. Koel, Erika P.M. van Elzakker. Scientific Spring Meeting of the Dutch Society of Medical Microbiology (NVMM) and the Royal Dutch Society of Microbiology (KNVM). Arnhem, The Netherlands, 2025.
3
Leptospirosis Reference Centre Expertise Centre for Leptospirosis (XCL) WOAH Reference Laboratory for Leptospirosis. van der Linden, H., Koel, M., Ahmed, A., dos Santos Ribeiro, P., van Elzakker, E., Ristow, P.. Poster presentation at the Amsterdam Microbiology Seminars (AMSA) meeting. Amsterdam, The Netherlands, 2025.
4
Exploring pathogenic Leptospira in environmental biofilm, soil, and water across different settings in the Netherlands. Snoodijk, A.; ter Bekke, P.; de Cock, M.; Visser, S.; van der Linden, H.; Koel, M.; Neves Souza, F.; Ahmed, A.; Elzakker, E.; Ristow, P.; dos Santos Ribeiro, P.. Poster presentation at the Amsterdam Microbiology Seminars (AMSA) meeting. Amsterdam, The Netherlands, 2025.
5
Evaluation of TaqMan-based Real-time PCR targeting the lipL32 Gene in Urine Samples for Early Diagnosis of Leptospirosis. Klein, E.; Van der Linden, H.; Ahmed, A.; Dos Santos Ribeiro, P.; Elzakker, E.; Ristow, P. Poster presentation at the Amsterdam Microbiology Seminars (AMSA) meeting. Amsterdam, The Netherlands, 2025.
6
Evaluation of Leptospira VirClia IgM Monotest for the Diagnosis of Human Leptospirosis. Emma M. de Koff, Manon C. Koel, Erika P.M. van Elzakker. Poster presentation at the Amsterdam Microbiology Seminars (AMSA) meeting. Amsterdam, The Netherlands, 2025.

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

1
RIVM. Staat van Zoönosen 2024 – 2. Trends [Internet]. Bilthoven: National Institute for Public Health and the Environment (RIVM); 2024 [cited 30 Jan 2026]. (published in 2025) Available from: https://www.onehealth.nl/staat-van-zoonosen-2024/trends#2024lepto

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

Yes

a) Technical visit : 2

b) Seminars : 7

c) Hands-on training courses: 0

d) Internships (>1 month) 3

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
C	UKRAINE	8
A	UGANDA	1
D	BRAZIL	1
B	BRAZIL	6
B	INDONESIA	1
A	AUSTRALIA	1
D	GERMANY	2

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	

NEN-EN-ISO 15189:2012	20240523 Declaration of accreditation M178- H02 signed.pdf	20240523 Declaration of accreditation M178-H02 signed.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Microscopic Agglutination Test	Dutch Accreditation Council
ELISA	Dutch Accreditation Council
PCR	Dutch Accreditation Council
Culture	Dutch Accreditation Council
Typing	Dutch Accreditation Council

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

Yes

Institutional biorisk procedures following national and international standards; also referenced in Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4.

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 during the past 2 years?

Yes

Purpose of the proficiency test:	Role of your Reference Laboratory (organiser/ participant)	No. participating Laboratories	Participating WOAH Ref. Labs/ organising WOAH Ref Lab
MAT International Proficiency Testing	Organiser and participant	2	Leptospira Research Lab ICARNIVEDI, India; Leptospirosis Reference Laboratory, Amsterdan University Medical Center, Amsterdam, the Netherlands

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?

No

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 during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
				AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHINA (PEOPLE'S REP. OF), COLOMBIA, CROATIA,

Assessing laboratory performance and verifying the accuracy and reliability of test results	Organizer and participant	88	MAT International Proficiency Test	CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, INDIA, INDONESIA, IRAN, ISRAEL, ITALY, MALAYSIA, NEW ZEALAND, PHILIPPINES, POLAND, PORTUGAL, ROMANIA, SERBIA, SLOVENIA, SPAIN, SWITZERLAND, THAILAND, THE NETHERLANDS, TURKEY, UKRAINE, UNITED KINGDOM, UNITED STATES OF AMERICA,
Assessing laboratory performance and verifying the accuracy and reliability of test results	Participant	4	EIL 2025 - European International Proficiency Testing	BELGIUM, FRANCE, SWITZERLAND,

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

No