World Organisation for Animal Health

Thomas Müller - - GERMANY

WOAH Reference Laboratory Reports Activities 2024

This report has been submitted: 7 janvier 2025 10:45

LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Rabies
***Address of laboratory:**	Südufer 10 D-17493 Greifswald - Insel Riems
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***E-mail address:**	Thomas.Mueller@fli.de
Website:	www.fli.de
***Name (including Title) of Head of Laboratory (Responsible Official):**	Dr Thomas Müller, Dr Conrad Freuling
***Name (including Title and Position) of WOAH Reference Expert:**	Dr Thomas Müller, Dr Conrad Freuling
***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
RFFIT	Yes	157	0
Direct diagnostic tests		Nationally	Internationally
FAT	Yes	121	7
Rt-qPCR	Yes	124	7
RTCIT	Yes	2	

			0
Vaccine virus titration	Yes	0	14
sequencing	Yes	5	5

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
autofluorescent CVS-11 strain	FAVN; RFFIT	FLI	2 ML	2 ML	1	AUSTRIA,

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?

Yes

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
lyophilized RT-qPCR	Freuling CM, van der Westhuizen J, Khaiseb S, Tenzin T, Müller T. From Field Tests to Molecular Tools-Evaluating Diagnostic Tests to Improve Rabies Surveillance in Namibia. Viruses 2023;15(2):371. https://doi.org/10.3390/v15020371.

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?

Yes

Name of the new vaccine developed	Description and References (Publication, website, etc)
NDV vectored rabies vaccine	Murr M, Freuling C, Pérez-Bravo D, Grund C, Mettenleiter TC, Römer-Oberdörfer A et al. Immune response after oral immunization of goats and foxes with an NDV vectored rabies vaccine candidate. PLoS Neglect. Trop. Dis. 2024;18(2):e0011639. https://doi.org/10.1371/journal.pntd.0011639.

TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

Name of WOAH Member Country seeking assistance	Date	Which diagnostic test used	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
DENMARK	2024-01-14	FAT, RT-qPCR	2	2
DENMARK	2024-08-20	FAT, RT-qPCR	5	5

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
NAMIBIA	oral vaccination of dogs	conduction of a large-scale field trial
NAMIBIA	Implementation of RT-qPCR	working visit/training of Namibian colleagues
TURKEY	oral vaccination of foxes	Online consultation on adapting the vaccination areas and vaccination strategy
TURKEY	oral vaccination of dogs	comparative bait acceptance study

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
Bait acceptance studies	1 week	Comparison of the acceptance of different types of bait for the oral vaccination of dogs	Ministry of Agriculture & Forest, Ankara; Provincial Veterinary Office, Mardin	TURKEY
Oral vaccination of dogs	2 weeks	Large-scale introduction and exploration of increasing the efficiency of the method in African regions	Namibian Directorate of Veterinary Services	NAMIBIA

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:
Rabies surveillance and ORV data for Europe (Rabies Bulletin Europe)

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:
Rabies surveillance and ORV data for Europe (Rabies Bulletin Europe)

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:

5

Wallace, R.M., Müller, T. 2024. Challenges and opportunities for the next miles in global rabies control. Rev Sci Tech 2024; Special Edition:74-82. https://doi.org/10.20506/rst.SE.3561.

Aylan, O., Sertkaya ,B., Demeli, A., Vos, A., Hacioglu, S., Atıcı, Y.T., Yıldız, D.A., Müller, T., Freuling, C.M. 2024. Oral rabies vaccination of foxes in Turkiye, 2019 – 2022; planning, implementation and evaluation. One Health. 2024 Aug 28;19:100877. doi: 10.1016/j.onehlt.2024.100877

Rupprecht, C.E., Buchanan, T., Cliquet, F., King, R., Müller, T., Yakobson, B. Yang, D-K. 2024. A perspective on oral vaccination of wildlfie against rabies. J Wildl Dis. 2024 Feb 21. doi: 10.7589/JWD-D-23-00078

Murr, M., Freuling, C.M., Pérez Bravo, D., Grund, C., Mettenleiter, T.C., Römer-Oberdörfer, A., Müller, T., Finke, S. 2024. Immune response after oral immunization of goats and foxes with an NDV vectored rabies vaccine candidate. PlosNTD 2024 Feb 26;18(2):e0011639. doi: 10.1371/journal.pntd.0011639

Tenzin T., Hikufe, E., Hedimbi, N., Athingo, R., Shikongo, B., Shuro, T., Iipinge, J., Herman, N., Naunyango, M., Haufiku, F., Peter, J., Hango, L., Gottlieb, S., Shoombe, K., Denzin, N., Busch, F., Lohr, F., Letshwenyo, M., Torres, G., Freuling, C.M., Müller, T., Shilongo, A. 2024. Dog Ecology and Rabies Knowledge, Attitude and Practice (KAP) in the Northern Communal Areas of Namibia. PlosNTD Feb 5;18(2):e0011631. doi: 10.1371/journal.pntd.0011631

b) International conferences:

2

Müller, T., Freuling, C.M. The importance of efficient mass dog vaccination campaigns against rabies Rabies. Sub-Regional workshop: "Dog mediated rabies control and elimination, and improvement of dog population management" 22-23 April 2024, Qatar

Freuling, C.M., Müller, T. Oral rabies vaccination in Africa. DEFRA/APHA World Rabies Day Webinar, 1 October 2024

c) National conferences:

1
Freuling, C.M., Müller, T. Rabies - history and current research findings. Scientific colloquium of the Central Institute of the Bundeswehr Medical Service Kiel, 14 March 2024, Kiel, Germany

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

2
Freuling, C.M., Müller, T. Epidemiology of bat rabies. Tropical course for physicians, 10 April 2024, Hamburg, Germany

Freuling, C.M., Müller, T. Fundamentals on rabies pathogenises, epidemiology, prevention and control, 10 April 2024, Hamburg, Germany

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 : 0

b) Seminars : 0

c) Hands-on training courses: 1

d) Internships (>1 month) 0

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	NAMIBIA	2

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 QMS	PDF	Akkreditierungsurkunde_2024.pdf

19. Is your quality management system accredited?

Yes

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Test for which your laboratory is accredited	Accreditation body
FAT	Deutsche Akkreditierungsstelle - DAkkS
RTCIT	Deutsche Akkreditierungsstelle - DAkkS
conventional RT-PCR	Deutsche Akkreditierungsstelle - DAkkS
RT-qPCR	Deutsche Akkreditierungsstelle - DAkkS
FAVN	Deutsche Akkreditierungsstelle - DAkkS
RFFIT	Deutsche Akkreditierungsstelle - DAkkS
Vaccine virus titration	Deutsche Akkreditierungsstelle - DAkkS

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

Yes

Work with lyssaviruses of risk group 3** and 3 is carried out under BSL 3 and S3 conditions.

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?

Yes

Title of event	Date	location	Role (speaker, presenting poster, short communications)	Title of the work presented
Rabies Sub-Regional workshop: "Dog mediated rabies control and elimination, and improvement of dog population management"	2024-04-21	Qatar	Speaker	The importance of efficient mass dog vaccination campaigns against rabies

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

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
WOAH Reference Laboratory Network for Rabies (RABLAB)	Co-Lead	14	WOAH RLs for Rabies (Canada, Chinese Taipei, France, Germany, India, Israel, Italy, Korea, Mexico, Peoples Republic of China, Romania, South Africa, United Kingdom, United states of America)

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
ILCT on pan-lyssavirus RT-PCR	Participant	24	Participating WOAH Ref. Labs.: Germany, Romania, France, Italy, UK Organising WOAH Ref Lab: France

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?

Not applicable (only WOAH Reference Laboratory designated for the disease

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?

No

No

TOR12: EXPERT CONSULTANTS

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

Yes

Kind of consultancy	Location	Subject (facultative)
ad hoc Group meeting	Virtual	Endorsement of Official Control Programmes for dog-mediated rabies of Members
responding to specific technical queries from WOAH	Virtual	Rabies point-of-care tests (lateral flow devices)

29. Additional comments regarding your report:

Yes

1. The timely provision of reference material, ICLT or PT samples for rabies is increasingly hampered by time-consuming national and EU-mandated export control procedures.

2. Scientific studies on the evolution and characterization of pathogens, including lyssaviruses, are becoming extremely difficult or practically impossible, especially for countries that have ratified the Nagoya Protocol. The reason for this is that contact persons for the Nogoya Protocol in many countries are non-existent, difficult to reach, slowly or not acting at all. This severely hampers animal disease diagnostics and control.