

WOAH Reference Laboratory Reports Activities 2025

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LABORATORY INFORMATION

*Name of disease (or topic) for which you are a designated WOA Reference Laboratory:	Rabies
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*Name (including Title) of Head of Laboratory (Responsible Official):	Dr Thomas Müller, Dr Conrad Freuling
*Name (including Title and Position) of WOA 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 WOA Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests			
ELISA	No	63	0
RFFIT	Yes	41	0
Direct diagnostic tests			
FAT	Yes	183	38
VIZ	Yes	7	0
RT-PCR	Yes	9	30
sequencing	Yes	10	28

TOR2: REFERENCE MATERIAL

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

No

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

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient WOA Member Countries	Country of recipients
FITC Anti-Rabies	FAT	provided	0	10 ML	1	NAMIBIA,

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Monoclonal Globulin						
Primer-probe mix	RT-PCR	provided	0	5 ML	1	NAMIBIA,
ELISA test kit	antibody detection	provided	0	1	1	NAMIBIA,

4. Did your laboratory produce vaccines?

Not applicable

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

TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

Name of WOA 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	2025-06-27	FAT, RT-PCR	6	6
ROMANIA	2025-07-30	FAT, RT-PCR, sequencing	22	22

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

Yes

Name of the WOA Member Country receiving a technical consultancy	Purpose	How the advice was provided
NAMIBIA	oral vaccination of dogs	field trial, workshop
TURKEY	oral vaccination of dogs (data capturing via WVS App)	online workshop, support on backend platform
ROMANIA	support with human rabies case	laboratory confirmation, virus characterization, phylogenetic analysis, publication
DENMARK	wildlife surveillance	laboratory diagnostic & confirmation, virus characterization

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOA 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
Oral vaccination of dogs	1 year	field implementation	Directorate of Veterinary Services (DVS)	NAMIBIA
Oral vaccination of herbivores	4 months	immunogenicity study	UNAM	NAMIBIA
Rabies in wildlife	1 year	rabies in seals	DVS, CVL	NAMIBIA
Oral vaccination of dogs	4 months	field implementation	DVS, Ministry of Agriculture	TURKEY
Recombinant rabies vaccine	1 year	characterization of vaccine vector virus candidate	Ministry of Agriculture,	CANADA

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

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 data from European countries

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 data from European countries

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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Müller, T., Denzin, N., Vos, A., Freuling, C.M. 2025. Incubation periods and survival rates of rabies virus infections in mesocarnivorous reservoir hosts – impacts on experimental design and veterinary regulations: A review and meta analysis. *Viol J.* 2025 Nov 14;22(1):374. doi: 10.1186/s12985-025-02996-0

Hurmuzache, M., Gradinaru, M.A., Bărbuceanu, F., Moțiu, R., Popescu, R., Lutić, A., Müller, T., Freuling, C.M., Vuta, V. 2025. Autochthonous Human Rabies Case in Romania: Rabies Death in the EU/EEA call for action. *Eurosurveillance* 30. <https://doi.org/10.2807/1560-7917.ES.2025.30.43.2500794>

Gieraths, U., Beheim-Schwarzbach, J., Pickin, M.J., Beyer, A., Begeman, L., Hoffmann, B., Schlottau, K., Beer, M., Ulrich, R., Müller, T., Freuling, C.M., Mauno, T., van de Bildt, M., Mols, V., Corman, V.M., Weber, F., Jones, T.C., Drosten, C. 2025. A century-old museum sample reveals a Bandavirus with modern day presence in northern European bats. *bioRxiv preprint* doi: <https://doi.org/10.1101/2025.02.28.640763>

Kuhn, J.H., Adkins, S., Alkhovsky, S.V., An, W., Avšič-Županc, T., ... Freuling, C.M., Müller, T., ... et al. 2025. Annual (2024) taxonomic update of RNA-directed RNA polymerase-encoding negative-sense RNA viruses (realm Riboviria: kingdom Orthornavirae: phylum Negarnaviricota). *J. Gen. Virol.* 2025;106(6).

Müller, T., Freuling, C.M. Rabies in Terrestrial Animals. 2025. In: Jackson A.C., Fooks, A.R. Rabies Scientific Basis of the Disease and Its Management 5th Edition - August 5, 2025

b) International conferences:

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- EURL Rabies workshop, June 2025, France
- UAR Stakeholder Meeting, October 2025, Bangkok
- 11th European Meeting on Viral Zoonoses (EMVZ), September 2025, France
- Rabies in the Americas Conference, October 2025, Peru
- International Workshop on Oral Rabies Vaccination of Dogs, November 2025, Namibia
-

c) National conferences:

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- Annual Virology Congress, March 2025, Germany

- National Rabies Stakeholder Meeting, MArch 2025, Namibia
- Ceva Vaccine and Innovation Days, November 2025, Germany
- ORV Workshop Rundu, March 2025, Namibia
- Annual Course for Tropical Medicine, April 2025, Germany
- Niedersächsiches Tiergesundheits Symposium 2025

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

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- UAR Webinar on Lateral Flow Devices, Dezcmbler 2025
- One Health Webinar on Bat Rabies, December 2025

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAHP 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 (flexible accreditation)	PDF	Akkreditierungsurkunde_2024.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
FAT	Deutsche Akkreditierungsstelle (DAkKS)
RT-qPCR	Deutsche Akkreditierungsstelle (DAkKS)
conventional RT-PRC	Deutsche Akkreditierungsstelle (DAkKS)
VIZ	Deutsche Akkreditierungsstelle (DAkKS)
RFFIT	Deutsche Akkreditierungsstelle (DAkKS)
FAVN	Deutsche Akkreditierungsstelle (DAkKS)
ELISA	Deutsche Akkreditierungsstelle (DAkKS)

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

Yes

The FLI has a Biological Risk Committee that deals with all aspects of biological safety and biological protection for all pathogens and diseases and meets regularly.

Appropriate operating instructions have been established.

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	location	Role (speaker, presenting poster, short communications)	Title of the work presented
Namibian rabies stakeholder meeting	2025-04-01	Swakopmund, Namibia	Speaker	• A WOAHP Laboratory Twinning Project comes to an end – Conclusions after 6 years of intensive cooperation between FLI and CVL • Oral rabies

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				vaccination of dogs - results from field trials in Namibia
UAR Webinar on LFDs	2025-12-08	online	Expert	<ul style="list-style-type: none"> Strengthening Rabies Surveillance: Where Do Lateral Flow Devices Fit?
International ORV Workshop	2025-11-04	Windhoek, Namibia	Speaker	<ul style="list-style-type: none"> Global burden of canine-mediated rabies History, concept of ORV and requirements for vaccines Safety aspects of ORV usage in the field ORV field trials in Namibia
XXXVI Conference on Rabies in the Americas 2025	2025-10-18	Lima, Peru	Speaker, Moderator	<ul style="list-style-type: none"> Large-Scale Oral Rabies Vaccination (ORV) Campaigns in Namibia: A Scalable Tool for Dog-Mediated Rabies Control

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

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAHP REF. LABS
UAR Forum	Participant	50	see UAR webpage
RABLAB	Participant, Co-leader	14	see WOAHP RL webpage

25. Did you organise or participate in inter-laboratory proficiency tests with WOAHP 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 WOAHP Ref. Labs/ organising WOAHP Ref Lab
antigen detection (FAT, RT-qPCR, VIZ)	participant	32	ANSES, WOAHP & EU RL for Rabies Nancy, France
rabies serology	participant	33	ANSES, WOAHP & EU RL for Rabies Nancy, France

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
Extra-label Use of Parenteral Rabies Vaccines in Mammalian Species	To evaluate immunogenicity, persistence of antibody response, survival after challenge, and anamnestic response following extra-label parenteral rabies vaccination across mammalian species, compared with benchmarks from on-label canine vaccination.	WOAHP RL CDC, USA WOAHP RL FLI, Germany
ONRAB	In-vitro and in vivo characterization of vectored rabies vaccine candidate	WOAHP RL FLI, Germany WOAHP RL CFIA/ACIA, Canada

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 during the past 2 years?

Yes

Purpose for	Role of your reference			

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inter-laboratory test comparisons ¹	laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
antigen detection	participant	32	FAT, RT-qPCR, VIZ	

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 meeting	Paris	endorsement of dog rabies control programmes
technical paper	Paris	WOAH Rabies Reference Laboratory Network's (RABLAB) overview of LFD tests for field application

29. Additional comments regarding your report:

No