# WOAH Reference Laboratory Reports Activities 2022

## Activities in 2022

### This report has been submitted : 25 avril 2023 16:40

## *Laboratory Information*

| | |
|---|---|
| **Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:** | Rabies |
| **Address of laboratory:** | Institut for Molecular Virology and Cell Biology, Friedrich-Loeffler-Institut, Suedufer 10, 17493 Greifswald-Insel Riems, Germany |
| **Tel.:** | +493835171659 |
| **E-mail address:** | thomas.mueller@fli.de |
| **Website:** | www.fli.de |
| **Name (including Title) of Head of Laboratory (Responsible Official):** | Dr Thomas Müller |
| **Name (including Title and Position) of WOAH Reference Expert:** | Dr Thomas Müller, Dr Conrad M. Freuling |
| **Which of the following defines your laboratory?<br>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 | 494 | 69 |
| ELISA | YES | 493 | 180 |
| Direct diagnostic tests | | Nationally | Internationally |
| FAT | YES | 235 | 14 |
| RTCIT | YES | 8 | |

| | | | |
|---|---|---|---|
| | | | 0 |
| Realtime PCR | YES | 366 | 40 |
| Vaccine virus titration | NO | 11 | 2 |
| Sequencing | NO | 10 | 25 |

# 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 |
|---|---|---|---|---|---|---|
| Anti-rabies conjugate | FAT | PROVIDED | 5 | ML | 2 | Africa |
| RNA extraction kit | Realtime PCR | PROVIDED | 1 | | 1 | Africa |

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

| NAME OF THE NEW TEST OR DIAGNOSTIC METHOD DEVELOPED | DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.) |
|---|---|
| discriminatory PCR | Freuling et al., 2023. From field tests to molecular tools – evaluating diagnostic tests to improve rabies surveillance in Namibia. Viruses (under review) |

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

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

Yes

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-G | Rabies virus G expressing NDV construct |

| | |
|---|---|
| SPBN GASGAS | Bobe et al., 2023. Efficacy of oral rabies vaccine baits containing SPBN GASGAS in domestic dogs according to international standards. Viruses (under review) |

# 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 | 2022-04-27 | FAT | | 7 |
| UNITED STATES OF AMERICA | 2022-05-16 | FAT | | 5 |
| THE NETHERLANDS | 2022-09-19 | PCR | | 22 |
| THAILAND | 2022-05-23 | RFFIT | 129 | |
| NAMIBIA | 2022-06-20 | PCR | 8 | 8 |

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 | Provision of OIE/WHO standards, expert opinion and technical support on dog rabies elimination in northern communal areas in Namibia | Meeting |
| NAMIBIA | WOAH Laboratory Twinning Project | workshop, zoom meetings |
| NAMIBIA | ORV of dogs against rabies | field trial |
| BOTSWANA | WOAH Project - Southern African Rabies Laboratory Network | workshop, zoom meetings |
| ZAMBIA | WOAH Project - Southern African Rabies Laboratory Network | workshop, zoom meetings |
| ANGOLA | WOAH Project - Southern African Rabies Laboratory Network | workshop, zoom meetings |
| NAMIBIA | WOAH Project - Southern African Rabies Laboratory Network | workshop, zoom meetings |

# 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 |
|---|---|---|---|---|
| ORV of dogs against rabies | 10 days | Effectiveness of ORV under field conditions | Directorate of Veterinary Services | NAMIBIA |
| Technical Support for Namibia in Eliminating Rabies in Dogs | long-term | Provision of OIE/WHO standards, expert opinion and technical support on dog rabies elimination | Directorate of Veterinary Services | NAMIBIA |
| Immunogenicity of an oral rabies vaccine in dogs | 2.5 years | Determination of humoral immune response of Thai dogs after oral vaccination | Kasetsart University | THAILAND |
| ORV of jackals | 1 | Determination of humoral immune response of Thai dogs after oral vaccination | Kimron Institute; WHO ref. lab for rabies | ISRAEL |

# 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 for Europe (see https://www.who-rabies-bulletin.org/) |

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 for Europe (see https://www.who-rabies-bulletin.org/) |

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*

*Dafalla et al. Low to moderate prevalence of Brno loanvirus, a bat-borne hantavirus, in the Noctule bat (Nyctalus noctula) in Germany, Poland and Austria. Virus Genes. 2022 Dec 21*

*Smreczak et al. 2022. Re-emergence of Rabies in Mazowieckie Voivodship, Poland, 2021. Zoonoses Public Health. 2022;00:1–6.*

*Freuling et al. 2022. Oral rabies vaccination of dogs – experiences from a field trial in Namibia. PlosNTD 16 (8), e0010422.*

*Müller et al. 2022. Rabies in kudu revisited. Adv Virus Res. 2022;112:115-173.*

*Schütz et al. 2022. Computer Vision for Detection of Body Posture and Behavior of Red Foxes. Animals,12, 233.*

*Klein et al. Comparative pathogenesis of different phylogroup I bat lyssaviruses in a standardized mouse model. PLoS Negl Trop Dis. Jan18;16(1):e0009845.*

b) International conferences:

*15*

*Freuling et al. From lab to field - Rabies control in Namibia as a One Health intervention. One Health Conference Greifswald, 28.04.2022*

*Freuling et al. Oral vaccination of dogs in Namibia. World Rabies Day: Global Opportunities & Challenges to Rabies Detection, Prevention & Control, 15.09.2022*

*Freuling et al. ORVs handling, storage, transportation and oral-bait-handout method: A practical experience. WOAH Information Session on Oral Rabies Vaccines (ORVs), 28.10.2022*

*Murr et al. Recombinant Newastle disease virus as vector vaccines against rabies and pest des petits ruminants. Negative Strand RNA Virus meeting; Braga, 12-17 June 2022*

*Freuling et al. Update on bat rabies research in Germany. 13th Workshop for Rabies (Warzawa, Poland),15.06.2022*

*Freuling et al. Germany: Imported rabies case in a dog, 2021. 13th Workshop for Rabies (Warzawa, Poland), 16.06.2022*

*Freuling et al. Considerations for future of Namibian Rabies Control. Namibian National Stakeholder Meeting on Rabies, Ondangwa, Namibia, 07.03.2022*

*van der Westerhuizen et al. Update on the WOAH lab twinning project Namibian. National Stakeholder Meeting on Rabies, Ondangwa, Namibia, 07.03.2022*

*Freuling et al. The epidemiology of rabies and the link between dog-mediated and wildlife-mediated rabies. OIE Virtual Workshop on Oral Rabies Vaccines, 28.02.2022*

*Müller et al. The concept of oral rabies vaccination in wildlife and experiences in control of sylvatic rabies in Europe. OIE Virtual Workshop on Oral Rabies Vaccines, 28.02.2022*

*Müller et al. The safety and efficacy of ORVs based on trials conducted across the world. WOAH Information Session on Oral Rabies Vaccines (ORVs), 28.10.2022*

*Müller et al. Oral vaccination from foxes to dogs. Massive Open Online Course - MOOC Rabies, 08.11.2022*

*Müller et al. Utilizing Oral Rabies Vaccines to accelerate canine vaccination efforts. Joint WHO CC, WOAH RABLAB and UAR meeting, 13.12.2022*

*Freuling et al. A field trial on ORV of dogs in Namibia. Joint WHO CC, WOAH RABLAB and UAR meeting, 13.12.2022*

*Müller et al. Vom Labor ins Feld - Tollwutbekämpfung in Namibia als One-Health-Maßnahme. International Instiute Seminar AGES Vienna, 14.12.2022*

c) National conferences:

*4*
*Freuling et al. From lab to field - Rabies control in Namibia as a One Health intervention. Riemser Diagnostiktage, 14.11.2022*
*Freuling et al. Epidemiology of bat rabies. Tropenkurs für Mediziner, 07.04.2022*
*Freuling et al. Fundamentals on rabies pathogenises, epidemiology, prevention and control. Tropenkurs für Mediziner, 07.04.2022*
*Müller et al. Epidemiology & Global Occurrence of Rabies. Tropenkurs für Mediziner, 07.04.2022*

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

*1*
*https://www.who-rabies-bulletin.org/*
*https://www.fli.de*

# 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 : 0

c) Hands-on training courses: 8

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 |
|---|---|---|
| Molecular diagnosis of rabies | Namibia | 2 |
| Workshop on FAT and LFDs | Namibia, Botswana, Zambia, Angola | 8 |

# 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 | | Akkreditierungsurkunde_2022.pdf |

19. Is your quality management system accredited?

Yes

| Test for which your laboratory is accredited | Accreditation body |
|---|---|
| FAT | DakkS |
| RT-PCT | DakkS |
| RTICT | DakkS |
| RFFIT | DakkS |
| FAVN | DakkS |

| | |
|---|---|
| vaccine batch titration | DakkS |

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

Yes

Biorisk council with Biorisk manager established for the entire Friedrich-Loeffler-Institut

# TOR9: SCIENTIFIC MEETINGS

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

Yes

| NATIONAL/ INTERNATIONAL | TITLE OF EVENT | CO-ORGANISER | DATE (MM/YY) | LOCATION | NO. PARTICIPANTS |
|---|---|---|---|---|---|
| | Workshop on rabies diagnostics | WOAH | 2020-09-20 | Gaborone, Botswana | 15 |

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

Yes

| Title of event | Date (mm/yy) | Location | Role (speaker, presenting poster, short communications) | Title of the work presented |
|---|---|---|---|---|
| Joint WHO CC, WOAH RABLAB and UAR meeting | 2020-12-12 | Paris | Speaker | Utilizing Oral Rabies Vaccines to accelerate canine vaccination efforts |
| WOAH Information Session on Oral Rabies Vaccines (ORVs) Southeast Asia | 2020-02-28 | Online | Speaker | The epidemiology of rabies and the link between dog-mediated and wildlife-mediated rabies. The concept of oral rabies vaccination in wildlife and experiences in control of sylvatic rabies in Europe |
| WOAH Information Session on Oral Rabies Vaccines (ORVs) Southeast Asia | 2022-10-28 | Online | Speaker | The safety and efficacy of ORVs based on trials conducted across the world. ORVs handling, storage, transportation and oral-bait-handout method: A practical experience. |

# 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?

Yes

| PURPOSE OF THE PROFICIENCY TESTS: 1 | ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT) | NO. PARTICIPANTS | PARTICIPATING WOAH REF. LABS/ ORGANISING WOAH REF. LAB. |
|---|---|---|---|
| | participant | 20 | |

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

Yes

| PURPOSE OF THE PROFICIENCY TESTS: 1 | ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT) | NO. PARTICIPANTS | PARTICIPATING WOAH REF. LABS/ ORGANISING WOAH REF. LAB. |
|---|---|---|---|
| PCR | Participant | 20 | participating WOAH ref.labs: Germany, France, UK, Romania / organising 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?

Yes

| TITLE OF THE PROJECT OR CONTRACT | SCOPE | NAME(S) OF RELEVANT WOAH REFERENCE LABORATORIES |
|---|---|---|
| UAR Forum WS | Revision of the 2007 WHO recommendations on oral vaccination of dogs | WOAH ref. lab CDC Atlanta, USA |
| WOAH RABLAB network | leadership of the network together with WOAH ref. lab CDC Atlanta, USA | all WOAH reference laboratories |
| UAR Forum WS | Assessment of sensitivity and specificity of commercially available lateral flow devices (LFDs) for rabies | WOAH ref. laboratories: CDC Atlanta, USA & Nancy, France |
| Oral vaccination | Oral vaccination of golden jackals | WOAH ref. laboratory: Bet-Dagan, Israel |

# *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?

# *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 meetings | online | • WOAH Terrestrial Code Chapter 8.14.: Reduction of the post-serology waiting period from 90 to 30 days for dogs to be imported from infected countries or zones |
| review of WOAH Standards | online | Revision of WOAH Terrestrial Manual |

| | | |
|---|---|---|
| | | Chapter 3.1.19. |
| responding to specific technical queries from WOAH | online | Evaluation of country applications of dog rabies elimination programmes for WOAH endorsement |
| technical papers | online | Revision of the 2007 WHO recommendations on oral vaccination of dogs |
| review of WOAH Standards | Paris | leadership of the WOAH RABLAB network |

29. Additional comments regarding your report:

No