

OIE Reference Laboratory Reports Activities

Activities in 2020

This report has been submitted : 2021-01-21 17:01:52

Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Rabies
Address of laboratory:	Rabies Unit Private Bag X05 Onderstepoort 0110 SOUTH AFRICA
Tel.:	+27-12 529 94 39
Fax:	+27-12 529 93 90
E-mail address:	sabetac@arc.agric.za
Website:	www.arc.agric.za
Name (including Title) of Head of Laboratory (Responsible Official):	Claude Taurai Sabeta
Name (including Title and Position) of OIE Reference Expert:	Claude Taurai Sabeta
Which of the following defines your laboratory? Check all that apply:	Other: Research Institute

ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards

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 OIE Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests			
Immunoperoxidase test	yes, histological identification	2	0
Direct diagnostic tests			
Fluorescent antibody test	Yes	316	0
Fluorescent antibody virus neutralisation test	Yes	1693	252

ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards. To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.

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

No

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

No

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to OIE Member Countries?

No

ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?

No

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?

No

ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

Yes

Name of OIE Member Country seeking assistance	Date (month)	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
ESWATINI	August	Nil	5 (reverse-transcription PCR and sequencing of rabies viruses)

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

No

ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	OIE Member Countries involved other than your country
Spatial and temporal analysis of animal and human rabies cases in South Africa: 1997-2017	2 years	The purpose of the study was to promote the training and exchange of postgraduate students and research scientists of the two institutions.	Rakuno Gauken University	JAPAN
Public health awareness and seroprevalence of rabies in dogs in Limpopo National Park, and the phylogeny of rabies virus in Mozambique	3 years	Collaboration on rabies epidemiology in Mozambique	University Eduardo Mondlane	MOZAMBIQUE
Molecular epidemiology of lyssa viruses and other RNA viruses in fruit bats in Makurdi Benue State Nigeria	3 years	Student training towards a PhD on rabies in bat species in Nigeria.	University of Agriculture Makurdi	NIGERIA UNITED KINGDOM
Further evidence of Inadequate Quality in Lateral Flow Devices Commercially offered for the diagnosis of rabies	1 year	A multi-centred study to assess diagnostic sensitivity and their agreement with standard techniques.	Friedrich Loeffler Institut, Kimron Veterinary Institute, Onderstepoort Veterinary Institute, Istituto Zooprofilattico, Centers for Disease Control and Prevention, Canadian Food Inspection Agency, Anses, Animal and Plant Health Agency	CANADA FRANCE GERMANY ISRAEL ITALY SOUTH AFRICA UNITED KINGDOM UNITED STATES OF AMERICA

ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases

11. Did your Laboratory collect epizootiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:
The OIE Rabies Reference Laboratory at Onderstepoort is one of the two laboratories that test for rabies in animals. Monthly reports on the samples tested and the results are sent to the Agriculture, Land Reform and Rural Development.

12. Did your laboratory disseminate epizootiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:
<p>The OIE Rabies Reference Laboratory at Onderstepoort is one of the two laboratories that test for rabies in animals in South Africa. Monthly reports on the total number of samples tested and their results are compiled and sent to the Department of Agriculture, Land Reform and Rural Development and the Rabies Advisory Group. The results are also sent to the Rabies Advisory Group who then collate for the whole country and with the Global Alliance for Rabies Control assess all the results for the region to measure the progress of the member countries towards rabies elimination.</p>

13. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category)

a) Articles published in peer-reviewed journals: 8

1. Wallace RM, Cliquet F, Fehlner-Gardiner C, Fooks AR, Sabeta CT, Setién A, et al. (2020) Role of Oral Rabies Vaccines in the Elimination of Dog-Mediated Human Rabies Deaths. *Emerging Infectious Diseases*. 26(12):1-9. <https://dx.doi.org/10.3201/eid2612.201266>.
2. Coertse J, Grobler CS, Sabeta CT, et al. Lyssaviruses in Insectivorous Bats, South Africa, 2003–2018. *Emerging Infectious Diseases*. 2020; 26 (12):3056-3060. doi:10.3201/eid2612.203592.
3. Sabeta, C., Mohale, D., Phahladira, B., Ngoepe, E., Van Schalkwyk, A., Mogano, K., Chirima, G., Suzuki, T. & Makita, K. (2020). Complete coding sequences of 23 South African domestic and wildlife rabies viruses. *Microbiology Resource Announcements*.
4. Sabeta, C., Marston, D., McElhinney, L., Horton, D., Phahladira, B. & Fooks, A.R. (2020). Rabies in the African civet: an incidental host for lyssaviruses? *Viruses*, 12, 368: <https://doi.org/10.3390/v12040368>.
5. Sintayehu, M. A., Conan, C., Wentzel, W., Quan, M., Reininghaus, B., Biggs, L., Sabeta, C., Leisewitz, A., Crafford, J., Toka, F. & Knobel, D.L. (2020). Rabies vaccination of 6-week-old puppies born to immunized mothers: a randomized controlled trial in a high-mortality population of owned, free-roaming dogs. *Tropical Medicine and Infectious Diseases*. 5(1), 45; <https://doi.org/10.3390/tropicalmed5010045>
6. Eze, U., Coetzer, A., Scott, T., Anene, B.M., Ezeokonkwo, R.C., Nwosuh, C., Nel, L.H. & Sabeta, C. T. (2020). Economic and feasibility comparison of the dRIT and DFA for decentralized rabies diagnosis in resource-limited settings: The use of Nigerian dog meat markets as a case study. *Plos Neglected Tropical Diseases*. 14(2), <https://doi.org/10.1371/journal.pntd.0008088>.
7. Eze, U.U., Ngoepe, E.C., Anene, B.M., Ezeokonkwo, R.C., Nwosuh, C. & Sabeta C.T. (2020). Molecular detection of rabies lyssaviruses from dogs in Southeastern Nigeria: evidence of transboundary transmission of rabies in West Africa. *Viruses*. 12, 134. Doi.10.3390/v12020134.
8. Klein, A., Fahrion, A., Finke, S., Eyngor, M., Novak, S., Yakobson, B., Ngoepe, E., Phahladira, B., Sabeta, C., de Benedictis, P., Gourlaouen, M., et al. (2020). Further evidence of inadequate quality in lateral flow devices commercially offered for the diagnosis of rabies. *Tropical Medicine and Infectious Diseases*. 5, 13. doi: 10.3390/tropicalmed5010013.

b) International conferences: 1

Participated in an OIE Rabies webinar on 23 September 2020 and made a presentation on "Rabies diagnostic techniques/methods and surveillance in animals". The rabies webinar was organised and co-ordinated by the OIE Regional office in Gaborone (Botswana). The attendance of this webinar was about 120 participants from all parts of the world.

c) National conferences: 0

d) Other:

(Provide website address or link to appropriate information) 2

1. <https://www.dalrrd.gov.za/>
2. www.arc.agric.za

ToR 7: To provide scientific and technical training for personnel from OIE Member Countries**To recommend the prescribed and alternative tests or vaccines as OIE Standards**

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

Yes

- a) Technical visits: 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	Nigeria	1

ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned

15. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)
ISO17025	V 0003_6.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Fluorescent antibody test	SANAS
Fluorescent antibody virus neutralisation test	SANAS

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

Yes

(See *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4*)

ToR 9: To organise and participate in scientific meetings on behalf of the OIE

18. Did your laboratory organise scientific meetings on behalf of the OIE?

No

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
Africa Rabies Webinar Sharing Progress of Rabies Elimination in Africa To commemorate 2020 World Rabies Day	23-24 September 2020	Virtual	Speaker	Rabies diagnostic techniques/methods and surveillance in animals.

ToR 10: To establish and maintain a network with other OIE Reference Laboratories designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results

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

Yes

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

Yes

Purpose of the proficiency tests: ¹	Role of your Reference Laboratory (organiser/participant)	No. participants	Participating OIE Ref. Labs/ organising OIE Ref. Lab.
To assess the competence of laboratories involved in testing for rabies neutralising antibodies in pets to facilitate international movement.	Participant	80	The proficiency tests were organised by the European Reference Laboratory for Rabies at Anses.

¹ validation of a diagnostic protocol: specify the test; quality control of vaccines: specify the vaccine type, etc.

22. Did your laboratory collaborate with other OIE 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 OIE Reference Laboratories
Spatial and temporal analysis of animal and human rabies cases in South Africa: 1997-2017	Joint investigation, and training of postgraduate students and staff.	Division of Health and Environmental Sciences OIE Joint Collaborating Centre for Food Safety Rakuno Gakuen University (RGU), Department of Veterinary Medicine
Role of Oral Rabies Vaccines in the Elimination of Dog-Mediated Human Rabies Deaths	Joint publication led by Dr Wallace from the Centers for Disease Control in the USA.	All 12 international OIE Rabies Reference laboratories.
New Initiative for OIE Rabies Laboratory Network	The overarching goal of RABLAB is to develop closer relations between OIE-RLs for Rabies and other partners aiming to build strong partnerships for cooperation to support the OIE and the tripartite (OIE/WHO/FAO) in their global fight against rabies by ending dog-mediated human rabies deaths by 2030. Owing to its strong institutional links and participatory nature, it is an efficient working platform for the exchange of information within the animal health network and with links to the human health sector. By combining forces and expertise, the network strives to expand access to high-quality diagnostic services to continuously enhance regional and national diagnostic capacities, and contribute to worldwide improvement of laboratory-based rabies surveillance and information exchange.	All 12 international OIE Rabies Reference laboratories.

ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than OIE Reference Laboratories for the same disease?

Yes

Note: See Interlaboratory test comparisons in: *Laboratory Proficiency Testing* at: <http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing> see point 1.3

Purpose for inter-laboratory test comparisons ¹	No. participating laboratories	Region(s) of participating OIE Member Countries
To assess competence on serology testing of neutralisation antibodies in serum for pets intended for international movement.	80	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input checked="" type="checkbox"/> Middle East

ToR 12: To place expert consultants at the disposal of the OIE

24. Did your laboratory place expert consultants at the disposal of the OIE?

No

25. Additional comments regarding your report:

1. The laboratory still receives at least 4000 serum samples annually. However, we have observed almost a 75% decline in samples submitted from the field for the diagnosis of lyssavirus antigen. This decline in the number of submissions has also provided the laboratory with an opportunity to organise the rabies repository with a view to genetically characterise as many of the samples as possible. with this approach we sequenced full genomes of about 50 rabies viruses originating from both dogs and wildlife hosts.

2. We contributed a brief history of rabies from the African continent's perspective to a book. The chapter was co-authored by Rupprecht, C.E., Freuling, C.M., Mani, R., Carlos Palacios, C., Sabeta, C.T. & Ward, M. (May 2020). Chapter 1: A Brief History of Rabies – The Foundation for Global Canine Rabies Elimination. In: Rabies: scientific basis of the disease and its management, Fourth Edition Elsevier/Academic Press. Edited by Alan C. Jackson and Anthony R. Fooks.

3. Concluded a project proposal for a twinning project between the ARC and the National Animal Health Diagnostic and Investigation Center (Sebeta, Ethiopia). This was approved by the Biological standards Commission and started in January 2021.