OIE Reference Laboratory Reports Activities

Activities in 2019

This report has been submitted : 2020-01-20 14:02:17

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 9439
Fax:	+27-12 529 9390
E-mail address:	sabetac@arc.agric.za
Website:	www.arc.agric.za
Name (including Title) of Head of Laboratory (Responsible Official):	Dr Misheck Mulumba, Senior Manager Research: Animal Health and Protection
Name (including Title and Position) of OIE Reference Expert:	Dr Claude Taurai Sabeta
Which of the following defines your laboratory? Check all that apply:	Research

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	
Indirect diagnostic tests		Nationally	Internationally
Monoclonal antibody typing	Yes	3	0
Direct diagnostic tests		Nationally	Internationally
fluorescent neutralisation test	Yes	7747	100
Fluorescent antibody test	Yes	433	2
Polymerase chain reaction (PCR)	Yes	55	0

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?

Yes

NOTE: Currently, there are 22 laboratories that produce Standard Reference Reagents officially recognised by the OIE for 19 diseases/pathogens. Please click the following link to the list of OIE-approved International Standard Sera: http://www.oie.int/en/our-scientific-expertise/veterinary-products/reference-reagents/. If the reagent is not listed on this page, it is NOT considered OIE-approved. The next two questions allow you to indicate non-OIE-approved diagnostic reagents.

Supply imported OIE-approved SRR – Select where you import from list:

Disease	Test	Available from
Rabies	Fluorescent antibody virus neutralisation	Dr Florence Cliquet Anses Nancy, Laboratoire d'études sur la rage et la pathologie des animaux sauvages, Domaine de Pixérécourt, BP 9, 54220 Malzéville, France Tel: 33 (0)3 83.29.89.50 Fax: 33 (0)3 83.29.89.58 florence.cliquet@anses.fr

Type of reagent available	Related diagnostic test	Produced/ Supply imported	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	Name of recipient OIE Member Countries
Challenge Virus Standard	Fluorescent antibody virus neutralisation test	Produced	◉<10mL ○10-100mL ○100-500mL ○>500mL	◉<10mL ○10-100mL ○100-500mL ○>500mL	

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

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient OIE Member Countries	Region of recipients
Fluorescein isothiocyanate labelled conjugate	Fluorescent antibody test	Provided	0.0	0.5 ml	1	☒Africa ☐Americas ☐Asia and Pacific ☐Europe ☐Middle East

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
NAMIBIA	January	0	1 brain tissue
TANZANIA	February	0	1 brain tissue

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
Further evidence of inadequate quality in lateral flow devices commercially offered for the diagnosis of rabies	6 months	To assess their diagnostic performance in relation to FAT and RT-qPCR using a comprehensively broad panel of samples within a multi-centered study.	Friedrich-Loeffler-Institut (FLI), Federal Research Institute for Animal Health, Institute of Molecular Virology and Cell Biology, 17493 Greifswald-Insel Riems, Germany; Kimron Veterinary Institute (KVI), Veterinary Services and Animal Health, P.O. Box 12, Beit Dagan 50250, Israel Onderstepoort Veterinary Institute (OVI), Rabies Unit, Private Bag X05, Onderstepoort 0110, South Africa Istituto Zooprofilattico Sperimentale delle Venezie, Viral zoonoses department, Viale dell'Università, 10, 35020 - Legnaro (PD), Italy Centers for Disease Control and Prevention (CDC), Poxvirus and Rabies Branch, Division of High-Consequence Pathogens and Pathology, National Center for Emerging and Zoonotic Infectious Diseases, Atlanta, GA , 30329 USA, Canadian Food Inspection Agency / Government of Canada, Centre of Expertise for Rabies, Science Branch, Ottawa Laboratory Fallowfield, Animal Diseases Research Institute, 3851 Fallowfield Road, Nepean, Ontario K2H 8P9, Canada Agence Nationale de Sécurité Sanitaire de l'Alimentation, de l'Environnement et du Travail (Anses), Laboratoire de la faune sauvage de Nancy, Domaine de Pixérécourt, 54220 Malzéville Cedex, France, Animal and Plant Health Agency (APHA), Weybridge, New Haw, Addlestone, Surrey KT15 3NB, United Kingdom	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:
Rabies epidemiological data in South Africa generated from the two testing laboratories (namely Onderstepoort Veterinary Institute and Allerton Provincial Laboratory)is compiled through the Chairperson of the Rabies Advisory Group of South Africa, Dr Keith Perret. The compiled data is then submitted as a contribution to the Rabies Epidemiological Bulletin for the regional rabies-specific disease surveillance platform that acts as a centralised data gathering and analyses tool for countries to support implementation of their rabies elimination programmes.

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:
The rabies data generated is disseminated weekly to the Department of Livestock and Rural Development. This data was also presented at the Rabies Advisory Committee Meeting held in June 2019.

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: 2
1. Eze, U.U., Ngoepe, E.C., Anene, B.M., Ezeokonkwo, R.C., Nwosuh, C. and Sabeta C.T. (2019). Molecular detection of rabies lyssaviruses from dogs in Southeastern Nigeria: evidence of transboundary transmission of rabies in West Africa. Viruses.
ii. Contribution to a book chapter - Rupprecht, C.E., Freuling, C.M., Mani, R., Carlos Palacios, C., Sabeta, C.T. and Ward, M. (2020). Rabies: scientific basis of the disease and its management, Fourth Edition Elsevier/Academic Press. Edited by Alan C. Jackson and Anthony R. Fooks. Chapter 1: A Brief History of Rabies – The Foundation for Global Canine Rabies Elimination.

b) International conferences: 3
i. Dr Sabeta attended and made a presentation using rabies as a one health example at the 3rd Africa One Health Conference, held in Johannesburg, 5-7 February 2019.
ii. Dr Sabeta attended the write shop of the regional strategy for the Elimination of dog-mediated human rabies co-ordinated by the Southern African Development Community (SADC)in Johannesburg from 7-10 October 2019.
iii. Dr Sabeta attended Joint Technical Committee and Livestock Technical Committee Meeting of the SADC from 10-12 December 2019, Johannesburg, South Africa. During this meeting the strategy for the elimination of dog-mediated human rabies was presented and subsequently adopted by the joint technical committee.

c) National conferences: 4
i. The OIE Rabies Reference Laboratory made an oral presentation on “The neutralizing antibody titration in sera of dogs and cats vaccinated against rabies and destined for international movement” during the PetPort Conference held in Dinokeng, Gauteng, South Africa, May 2019.
ii. Dr Sabeta attended the Southern African Society for Veterinary Epidemiology & Preventive Medicine hosted in Umhlanga Kwazulu-Natal during 21-23 August 2019 and made a presentation on the limitations of diagnostic tests using rabies as an example.
iii. Dr Sabeta, Mr Ngoepe and Ms Phahladira attended the Annual Rabies Advisory Group Meeting held at the Onderstepoort on 12 June 2019.
iv. Dr Sabeta made a presentation on Animal Rabies Diagnosis at the World Rabies Day Scientific Evening in the Northern Cape (South Africa)on September 26, 2019.

d) Other:
(Provide website address or link to appropriate information) 1
www.daff.gov.za - rabies epidemiology data provided weekly.

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?

No

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	South African National Accrediting Sysytem (SANAS)
Fluorescent antibody virus neutralisation antibody 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?

No

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?

No

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
Comparison of five different commercially available LFDs.	Establish diagnostic sensitivity and specificity of selected lateral flow devices for rabies and their agreement with standard rabies diagnostic techniques (fluorescent antibody test and real-time PCR).	1. Friedrich-Loeffler-Institut (FLI), Federal Research Institute for Animal Health, Institute of Molecular Virology and Cell Biology, 17493 Greifswald-Insel Riems, Germany; Conrad.Freuling@fli.de (C.F.); Antonia.Klein@fli.de (A.K.); Thomas.Mueller@fli.de (T.M.) 2 Kimron Veterinary Institute (KVI), Veterinary Services and Animal Health, P.O. Box 12, Beit Dagan 50250, Israel 3 Onderstepoort Veterinary Institute (OVI), Rabies Unit, Private Bag X05, Onderstepoort 0110, South Africa sabetac@arc.agric.za 4 Istituto Zooprofilattico Sperimentale delle Venezie, Viral zoonoses department, Viale dell'Università, 10, 35020 - Legnaro (PD), Italy 5 Centers for Disease Control and Prevention (CDC), Poxvirus and Rabies Branch, Division of High-Consequence Pathogens and Pathology, National Center for Emerging and Zoonotic Infectious Diseases, Atlanta, GA , 30329 USA, xdv3@cdc.gov 6 Canadian Food Inspection Agency / Government of Canada, Centre of Expertise for Rabies, Science Branch, Ottawa Laboratory Fallowfield, Animal Diseases Research Institute, 3851 Fallowfield Road, Nepean, Ontario K2H 8P9, Canada 7 Agence Nationale de Sécurité Sanitaire de l'Alimentation, de l'Environnement et du Travail (Anses), Laboratoire de la faune sauvage de Nancy, Domaine de Pixérécourt, 54220 Malzéville Cedex, France, florence.cliquet@anses.fr 8 Animal and Plant Health Agency (APHA), Weybridge, New Haw, Addlestone, Surrey KT15 3NB, United Kingdom

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
Comparison of the fluorescent antibody test for rabies in brain-infected tissues.	3	☒Africa ☐Americas ☐Asia and Pacific ☐Europe ☐Middle East
Comparison of the fluorescent antibody test for rabies in brain-infected tissues.	49	☒Africa ☒Americas ☒Asia and Pacific ☒Europe ☒Middle East
fluorescent antibody virus neutralisation test for rabies antibodies in a panel of serum samples.	84	☒Africa ☒Americas ☒Asia and Pacific ☒Europe ☒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:

No requests were received for training at the laboratory. The single applicant for immunohistochemistry was referred to the University of Pretoria Department of Pathology as the OIE Rabies Reference Laboratory at Onderstepoort does not routinely run this test

Several manuscripts were submitted for review in 2019 and are still under review process:
I. Cliquet, F., Fehlner-Gardiner, C., Fooks, T., Müller, T., Sabeta, C., Aguilar Setién, A., Tu, C., et al. Role of oral rabies vaccines for dogs in the elimination of dog-mediated human rabies deaths. Lancet.
ii.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. Further evidence of inadequate quality in lateral flow devices commercially

offered for the diagnosis of rabies. Tropical Medicine and Infectious Diseases.
iii. Sintayehu, M. A., Conan, C., Wentzel, W., Quan, M., Reininghaus, B., Biggs, L., Sabeta, C., Leisewitz, A., Crafford, J., Toka, F. and Knobel, D.L. 2019. 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.
iv. Sabeta, C., Marston, D., McElhinney, L., Horton, D., Phahladira, B. and Fooks, A.R. 2019. Rabies in the African civet: an incidental host for lyssaviruses? Viruses.
v.Eze, U., Coetzer, A., Scott, T., Anene, B.M., Ezeokonkwo, R.C., Nwosuh, C., Nel, L.H. and Sabeta, C. T. 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.

Collaborated with the University of Pretoria (Viral Zoonoses Group) in characterising an apparently new lyssavirus species.

Made a presentation on "Rabies in South Africa: focus on molecular epidemiology" at the University of Makurdi in Nigeria.