

OIE Reference Laboratory Reports Activities

Activities in 2020

This report has been submitted : 2021-01-15 08:54:50

Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Foot and mouth disease
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Name (including Title) of Head of Laboratory (Responsible Official):	Misheck Mulumba, Dr
Name (including Title and Position) of OIE Reference Expert:	François Maree, Dr Specialist Researcher
Which of the following defines your laboratory? Check all that apply:	Other: Para-governmental; 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	
		Nationally	Internationally
Indirect diagnostic tests		Nationally	Internationally
Virus Neutralization Test	Yes	0	0
Solid phase competition ELISA	Yes	80,336	149
NSP ELISA	Yes	6,220	116
Direct diagnostic tests		Nationally	Internationally
Virus Isolation	Yes	33	0
RT-PCR	Yes	79	38
Sequencing	Yes	39	
Antigen ELISA (typing)	Yes		
Real-time RT-PCR	Yes		

**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
NAMIBIA	July	113	0
ESWATINI	July	116	0
ZIMBABWE	July	39	0

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
Synthetic modified dendrimer replicon RNA vaccines for cellular and humoral protection against multiple foot-and-mouth disease serotypes.	2 years	To evaluate a synthetic modified dendrimer replicon RNA vaccine for cellular and humoral protection against FMD in guinea pigs and cattle.	TIBA Biotech (USA) and Moredun Institute (Scotland)	UNITED STATES OF AMERICA
Construction of foot-and-mouth disease (FMD) virus-specific phage-display libraries and epitope identification for improved FMD vaccines generation.	1 year	Construction of foot-and-mouth disease (FMD) virus-specific phage-display libraries and epitope identification for improved FMD vaccines generation.	Institute of Virology, National Institute of Agricultural Technology (INTA), South America. The Pirbright Institute, UK. University of Glasgow, UK.	ARGENTINA UNITED KINGDOM

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 ARC-OVR and State Veterinary Services in Limpopo performed serological surveillance on six farms or diptank within the Limpopo district collecting bovine, ovine and caprine samples.

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

No

If the answer is no, please provide a brief explanation of the situation:
The sero-surveillance samples from Limpopo province is still being processed and tested. See papers and conference contributions below.

**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: 4

1. Ramulongo TD, Maree FF, Scott K, Opperman P, Mutowembwa P, Theron J. (2020) Pathogenesis, biophysical stability and phenotypic variance of SAT2 foot-and-mouth disease virus. *Vet Microbiol.* 243:108614. doi: 10.1016/j.vetmic.2020.108614.

2. Chitray M, Kotecha A, Nsamba P, Ren J, Maree S, Ramulongo T, Paul G, Theron J, Fry EE, Stuart DI, Maree FF. (2020). Symmetrical arrangement of positively charged residues around the 5-fold axes of SAT type foot-and-mouth disease virus enhances cell culture of field viruses. *PLoS Pathog.* 16(9): e1008828. doi: 10.1371/journal.ppat.1008828.

3. Chitray M, Opperman PA, Rotherham L, Fehrsen J, Van Wyngaardt W, Frischmuth J, Rieder E, Maree FF. (2020). Diagnostic and Epitope Mapping Potential of Single-Chain Antibody Fragments Against Foot-and-Mouth Disease Virus Serotypes A, SAT1, and SAT3. *Front Vet Sci.* 7: 568. doi: 10.3389/fvets.2020.00568.

4. Maake L, Harvey WT, Rotherham L, Opperman PA, Theron J, Reeve R, Maree FF. (2020). Genetic Basis of Antigenic Variation of SAT3 Foot-And-Mouth Disease Viruses in Southern Africa. *Front Vet Sci.* 7: 568. doi: 10.3389/fvets.2020.00568.

b) International conferences: 1

F.F. Maree, T.D. Ramulongo, K. Scott, P. Opperman, J. Theron. Biological Variance of SAT2 Foot-And-Mouth Disease Viruses. *EuFMD 2020.*

c) National conferences: 1

P.B Mutowembwa. Foot-and-Mouth Global Epidemiology□Prevention & Control from a global, SADC and SA experience & perspective. *SASVEPM 2020.*

d) Other:

(Provide website address or link to appropriate information) 0

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)
ISO 17025	V 0034.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
VNT	SANAS
LPBE	SANAS
NSP ELISA	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?

Yes

Purpose of the proficiency tests: ¹	Role of your Reference Laboratory (organiser/ participant)	No. participants	Participating OIE Ref. Labs/ organising OIE Ref. Lab.
The aim of this exercise is to complete a PTS for virology and serology diagnosis for FMD and SVD during 2018/2019.	participant	64	TAD, ARC-OVR

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
Construction of foot-and-mouth disease (FMD) virus-specific phage-display libraries and epitope identification for improved FMD vaccines generation.	Construction of foot-and-mouth disease (FMD) virus-specific phage-display libraries and epitope identification for improved FMD vaccines generation.	Institute of Virology, National Institute of Agricultural Technology (INTA), South America. The Pirbright Institute, UK. University of Glasgow, UK.

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?

No

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

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:

None