# WOAH Reference Laboratory Reports Activities 2023

## Activities in 2023

### This report has been submitted : 6 mai 2024 13:07

## Laboratory Information

| | |
|---|---|
| **Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:** | Fièvre Aphteuse |
| **Address of laboratory:** | 14 rue Pierre et Marie Curie |
| **Tel.:** | +330149771350 |
| **E-mail address:** | Stephan.ZIENTARA@anses.fr |
| **Website:** | www.anses.fr |
| **Name (including Title) of Head of Laboratory (Responsible Official):** | Dr Stéphan Zientara |
| **Name (including Title and Position) of WOAH Reference Expert:** | Dr Labib BAKKALI KASSIMI |
| **Which of the following defines your laboratory? Check all that apply:** | Governmental |

## 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 |
| ELISA NSP | | 15 | 531 |
| ELISA SPCE Type O | | 33 | 31 |
| ELISA SPCE Type A | | 0 | 31 |
| Séroneutralisation | | 1 | 6 |
| Direct diagnostic tests | | Nationally | Internationally |
| rtRT-PCR | | 2 | 222 |
| RT-PCR | | 0 | 115 |
| ELISA Antigène | | 0 | 38 |
| Isolement viral | | 0 | 97 |
| Séquençage | | 0 | 86 |

## 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 |
|---|---|---|---|---|---|---|
| kit one-step RT-PCR | RT-PCR | kit one-step RT-PCR (Qiagen) | 0 | 1 kit par pays (total 6 kits) | 6 | ARMENIA, AZERBAIJAN, GEORGIA, JORDAN, LEBANON, TURKEY, |
| Amorces | RT-PCR | Amorces | 0 | 10 amorces par pays | 6 | ARMENIA, AZERBAIJAN, GEORGIA, JORDAN, LEBANON, TURKEY, |
| ARN synthétique | RT-PCR | ARN synthétique | 0 | 3 par pays | 6 | ARMENIA, AZERBAIJAN, GEORGIA, JORDAN, LEBANON, TURKEY, |
| kit rtRT-PCR | rtRT-PCR 3D/Beta-actin | master mix prêt à l'emploi | 0 | 300 réactions | 1 | JORDAN, |
| kit rtRT-PCR | rtRT-PCR Type O/Beta-actin | master mix prêt à l'emploi | 0 | 100 réactions | 1 | JORDAN, |
| kit rtRT-PCR | rtRT-PCR Type A/Beta-Actin | master mix prêt à l'emploi | 0 | 100 réactions | 1 | JORDAN, |
| kit rtRT-PCR | rtRT-PCR SAT2-XIV/Beta-Actin | master mix prêt à l'emploi | 0 | 100 réactions | 1 | JORDAN, |

4. Did your laboratory produce vaccines?

Not applicable

5. Did your laboratory supply vaccines to WOAH Members?

Not applicable

## 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 WOAH Standards for the designated pathogen or disease?

No

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

No

9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease?

No

## 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 |
|---|---|---|---|---|
| OMAN | 2023-02-16 | rtRT-PCR, Isolement viral, ELISA Ag, Séquençage, ELISA NSP | 89 | 75 |
| COMOROS | 2023-02-15 | rtRT-PCR, Isolement viral, ELISA Ag, Séquençage, ELISA NSP | 0 | 114 |
| TUNISIA | 2023-06-05 | rtRT-PCR, Isolement viral, ELISA Ag, Séquençage, ELISA NSP | 0 | 13 |
| TUNISIA | 2023-12-22 | rtRT-PCR, Isolement viral, ELISA Ag, Séquençage | 0 | 9 |
| BURKINA FASO | 2023-10-23 | rtRT-PCR, Isolement viral, ELISA Ag, Séquençage | 0 | 64 |
| ALGERIA | 2023-12-29 | rtRT-PCR, Isolement viral, ELISA Ag, Séquençage | 0 | 22 |

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 |
|---|---|---|
| TUNISIA | Choix du vaccin | Email |
| ALGERIA | Choix du vaccin | Email |

# 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 |
|---|---|---|---|---|
| Improved control of priority animal diseases: Novel vaccines and companion diagnostic tests for African horse sickness, peste des petits ruminants and foot-and-mouth disease (SPIDVAC) | 2022-2026 | Develop innovative vaccines and companion diagnostic tests for three priority animal diseases listed as notifiable terrestrial diseases by the World Organisation for Animal Health (WOAH): African horse sickness (AHS), peste des petits ruminants (PPR) and foot and mouth disease (FMD) | FLI; CIRAD, CICbioGUNE, IDvet; BI; NOTT); CSIC, CISA-INIA; WBVR, UP; UoS; ISRA; LCV; ANSES | GERMANY SENEGAL SOUTH AFRICA SPAIN THE NETHERLANDS UNITED KINGDOM |
| From proteogenomic host response signatures of persistent foot-and-mouth disease virus (FMDV) infection to diagnostic markers and therapeutic control (FMDV_PersistOmics) | 2021-2024 | Identification of host response signatures infection, diagnostic markers and therapeutic control of persistent foot-and-mouth disease virus (FMDV) | SLU, FLI, SAP, Sciensano, ANSES | BELGIUM GERMANY SWEDEN TURKEY |

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

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: |
|---|
| Circulation de SAT2/XIV à Oman<br>Circulation SAT2/V en Algérie<br>Circulation de SAT1/I aux Comores<br>Circulation O/EA-3 en Tunisie |

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: |
|---|
| Circulation de SAT2/XIV à Oman<br>Circulation SAT2/V en Algérie<br>Circulation de SAT1/I aux Comores<br>Circulation O/EA-3 en Tunisie |

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:

*4*

*1-Romey Aurore, Ularamu Hussaini G., Bulut Abdulnaci, Jamal Syed M., Khan Salman, Ishaq Muhammad, Eschbaumer Michael, Belsham Graham J., Bernelin-Cottet Cindy, Relmy Anthony, Gondard Mathilde, Benfrid Souheyla, Wungak Yiltawe S., Hamers Claude, Hudelet Pascal, Zientara Stéphan, Bakkali Kassimi Labib and Blaise-Boisseau Sandra. Field evaluation of a safe, easy and low-cost protocol for shipment of samples from suspected cases of foot-and-mouth disease to diagnostic laboratories. TBED,. Volume 2023 | Article ID 9555213 doi.org/10.1155/2023/9555213*
*2-Sarry M, Bernelin-Cottet C, Michaud C, Relmy A, Romey A, Salomez AL, Renson P, Contrant M, Berthaud M, Huet H, Jouvion G, Hägglund S, Valarcher JF, Bakkali Kassimi L, Blaise-Boisseau S. 2023. Development of a primary cell model derived from porcine dorsal soft palate for foot-and-mouth disease virus research and diagnosis. Front Microbiol. Sep 29:14:1215347. doi: 10.3389/fmicb.2023.1215347. eCollection 2023.*
*3-Morgan Sarry, Grégory Caignard, Juliette Dupré, Stéphan Zientara, Damien Vitour, Labib Bakkali Kassimi and Sandra Blaise-Boisseau. Host specific interplay between Foot-and-Mouth Disease Virus 3D polymerase and the type I interferon pathway. Viruses, Mar 1;15(3):666. doi: 10.3390/v15030666*
*4-Horsington J, Abbeloos E, Kassimi LB, Boonsuya Seeyo K, Capozzo AV, Chepkwony E, Eblé P, Galdo-Novo S, Gizaw D, Gouverneur L, Grazioli S, Heath L, Hudelet P, Hyera JMK, Ilott M, King A, Lefebvre DJ, Mackay D, Metwally S, Mwiine FN, Nfon CK, Park M-K, Pituco EM, Rosso F, Simon F, Ularamu HG, Vermeij P, Vosloo W and King DP. 2023. Application of the Nagoya Protocol to veterinary pathogens: concerns for the control of foot-and-mouth disease.Front. Vet. Sci. 10:1271434.doi: 10.3389/fvets.2023.1271434*

b) International conferences:

*9*

*1. Morgan Sarry, Gregory Caignard, Juliette Dupré, Stephan Zientara, Damien Vitour, Labib Bakkali Kassimi et Sandra Blaise-Boisseau. « Interaction hôte spécifique de la polymérase 3Dpol du virus de la fièvre aphteuse avec la réponse interféron de type I. ». XXVIèmes journées francophones de Virologie, institut Pasteur, Paris, 17-18 avril 2023*
*2. Morgan Sarry, Grégory Caignard, Juliette Dupré, Stephan Zientara, Damien Vitour, Labib Bakkali Kassimi et Sandra Blaise-Boisseau. "Interplay between Foot-and-Mouth Disease Virus 3D polymerase and the type I interferon response: a contribution to viral persistence? 15th EPIZONE Annual Meeting, Novi-Sad, Serbia, 26-28 april 2023.*
*3. Morgan Sarry, Cindy Bernelin-Cottet, Caroline Michaud, Anthony Relmy, Aurore Romey, Anne-Laure Salomez, Hélène Huet, Grégory Jouvion, Sara Hägglund, Jean-François Valarcher, Labib Bakkali Kassimi and Sandra Blaise-Boisseau. "Development of a primary cell model derived from porcine dorsal soft palate for foot-and-mouth disease virus research and diagnosis." International Symposium of the World Association of Veterinary Laboratory Diagnosticians, ISWAVLD, Lyon France. 29/06-01/07 2023.*
*4. Romey Aurore, Ularamu Hussaini G, Bulut Abdulnaci, Jamal Syed M., Khan Salman, Ishaq Muhammad, Eschbaumer Michael, Belsham Graham J., Bernelin-Cottet Cindy, Relmy Anthony, Gondard Mathilde, Benfrid Souheyla, Wungak Yiltawe S., Hamers Claude, Hudelet Pascal, Zientara Stéphan, Bakkali Kassimi Labib and Blaise-Boisseau Sandra. "Field evaluation of a safe and cost-effective shipment of FMDV suspected samples to diagnostic laboratories using lateral flow devices". International Symposium of the World Association of Veterinary Laboratory Diagnosticians, ISWAVLD, Lyon France. 29/06-01/07 2023.*
*5. Wafa Ahmed Al-Rawahi; Bahja Al-Riyami; Elshafie Ibrahim Elshafie; Senan Baqir; Aliya Al-Ansari; Jemma Wadsworth; Hayley M. Hicks; Relmy Anthony, Romey Aurore, Salomez Anne-Laure, Girault Guillaume, Nick J. Knowles; Antonello Di Nardo; Donald P. King; Stephan Zientara; Cindy Bernelin-Cottet and Labib Bakkali-Kassimi. "Isolation and molecular characterization of foot-and-mouth disease virus strains circulating in the Sultanate of Oman between 2018 and 2023". International Symposium of the World Association of Veterinary Laboratory Diagnosticians, ISWAVLD, Lyon France. 29/06-01/07 2023.*
*6. Blaise-Boisseau S*. Molecular Interplays of FMDV with IFN Response and Importance of the Model Scientific Meeting of the Global Foot and Mouth Disease Research Alliance (GFRA), Kampala, (Ouganda), 8-10 Novembre 2023.*
*7. Michaud, C., Alvarez, I., Litz, B., Landmesser, A., Romey, A., Huet., H., Bernelin, C., Salomez, A.-L., Relmy, A., Zientara, S., Pfaff, F., Bakkali Kassimi, L., Eschbaumer, M., Valarcher, J.-F., Hägglund, S. and Blaise-Boisseau, S. Leaderless FMDV O does not establish a persistent infection in multilayered cells derived from bovine dorsal soft palate. Scientific Meeting of the Global Foot and Mouth Disease Research Alliance (GFRA), Kampala, (Ouganda), 8-10 Novembre 2023.*
*8. Litz, B., Sehl-Ewert, J. Landmesser, A., Pfaff, F., Romey, A., Blaise-Boisseau, S., Beer, M. and Eschbaumer, Leaderless FMDV is fully attenuated in vivo and unable to establish persistent infection. Junior Scientist Symposium 2023, Jena, 13 Novembre 2023*
*9. Litz, B., Landmesser, A., Pfaff, F., Blaise-Boisseau, S. and Eschbaumer, M. Leaderless FMDV O is fully attenuated in cattle and does not establish persistent infections. Scientific Meeting of the Global Foot and Mouth Disease Research Alliance (GFRA), Kampala, (Ouganda), 8-10 Novembre 2023.*

c) National conferences:

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

# *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 : 0

b) Seminars : 27

c) Hands-on training courses: 23

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 |
|---|---|---|
| B | FRANCE | 20 |
| C | JORDAN | 4 |
| C | LEBANON | 4 |
| C | MOROCCO | 2 |
| C | ALGERIA | 1 |
| C | EGYPT | 2 |
| C | LIBYA | 2 |
| C | SYRIA | 2 |
| C | PALESTINIAN AUTON. TERRITORIES | 2 |
| C | ARMENIA | 1 |
| C | AZERBAIJAN | 1 |
| C | GEORGIA | 1 |
| C | TURKEY | 1 |
| C | SLOVENIA | 1 |
| C | CZECH REPUBLIC | 1 |
| C | SERBIA | 2 |

# TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

| Quality management system adopted | Certificate scan (PDF, JPG, PNG format) | |
|---|---|---|
| ISO17025 | Cf Fichier attaché | Attestation 1-2246 révision 25.pdf |

19. Is your quality management system accredited?

Yes

| Test for which your laboratory is accredited | Accreditation body |
|---|---|
| ELISA | COFRAC |
| rtRT-PCR | COFRAC |

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

Yes

# TOR9: SCIENTIFIC MEETINGS

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

No

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 |
|---|---|---|---|---|
| Réunion annuelle des laboratoires de référence | 2023-10-11 | Winnipeg, Canada | Orateur | Revue des activités du laboratoire de référence pour 2023 |

# 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. Do you network (collaborate or share information) with other WOAH Reference Laboratories designated for the same pathogen?

Yes

| NETWORK/DISEASE | ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC) | NO. PARTICIPANTS | PARTICIPATING WOAH REF. LABS |
|---|---|---|---|
| LR OMSA | Participant | 13 | Onderstepoort Veterinary Institute, Senasa BVI Panaftosa Canadian Science Centre for Human and Animal Animal and Plant Quarantine Agency ANSES IZSLER Pirbright Institute FGI-ARRIAH Lanzhou Veterinary Research Institute National Veterinary Services Laboratories Sciensano |

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. |
|---|---|---|---|
| Diagnostic virologique et sérologique | Participant | 7 | Institut Pirbriight |
| Diagnostic virologique et sérologique | Organisateur | 4 | ANSES |

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?

No

# *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?

Yes

| **Purpose for inter-laboratory test comparisons1** | **Role of your reference laboratory (organizer/participant)** | **No. participating laboratories** | **Name of the Test** | **WOAH Member Countries** |
|---|---|---|---|---|
| Diagnostic virologique et sérologique | Participant | 49 | | |
| Diagnostic virologique et sérologique | Organisateur | 41 | | |

# *TOR12: EXPERT CONSULTANTS*

28. Did your laboratory place expert consultants at the disposal of WOAH?

No

29. Additional comments regarding your report:

No