OIE Collaborating Centres Reports Activities

Activities in 2018

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Title of collaborating centre:	ELISA and Molecular Techniques in Animal Disease Diagnosis
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Name of Director of Institute (Responsible Official):	Qu Liang, Director, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, International Atomic Energy Agency, Vienna, Austria
Name (including Title and Position) of Head of the Collaborating Centre (formally OIE Contact Point):	Giovanni Cattoli, Head, Animal Production and Health Laboratory, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, International Atomic energy Agency, Seibersdorf, Austria
Name of writer:	Giovanni Cattoli

ToR: To provide services to the OIE, in particular within the region, in the designated specialty, in support of the implementation of OIE policies and, where required, seek for collaboration with OIE Reference Laboratories

ToR: To identify and maintain existing expertise, in particular within its region

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by the OIE

Training, capacity building	
Title of activity	**Scope**
Training Course on of Transboundary Animal Diseases diagnosis: sequencing and bioinformatic analysis of animal pathogen genomes.	The course aimed at strengthening participants' capacity in genomic sequence data analysis for the diagnosis and identification of pathogens causing zoonosis and transboundary animal diseases.
Group training on diagnosis and confirmation of selected animal diseases.	To train veterinary laboratory staff in South East Asia on laboratory diagnosis of selected transboundary animal and zoonotic diseases (including Classical and African Swine Fever, capripox virus diseases, PPR, gene sequencing and molecular epidemiology).
Advanced training on transboundary animal diseases diagnosis and molecular epidemiology.	To provide in-depth training to selected staff of veterinary diagnostic laboratories in Africa and Asia that are serving or will serve as trainers for other laboratories.
Diagnosis, biotechnology and laboratory	
Title of activity	**Scope**
Molecular epidemiology and genome sequencing study - samples (viruses).	176 new samples for molecular characterization from Botswana, Burkina Faso, Burundi, Cameroon, Ethiopia, Ghana, Kazakhstan, Kenya, Mozambique, Mongolia, Namibia, Tanzania and Zambia (ASFV, PPRV, Newcastle disease virus, Pseudocowpox virus; RVFV, Capripox virus, avipox virus).
Molecular epidemiology and genome sequencing study - sequence analysis.	271 virus partial genome sequences were analyzed and made publicly available on the genetic database (GenBank).
Serology - Capripox viruses	To serologically characterize serum samples for Lumpy Skin Disease. Samples were tested by Virus Neutralization Test and tested by a prototype ELISA. Preliminary validation of the indirect ELISA prototype.
Differentiation of Sheep poxvirus vaccine strains from field isolates by High Resolution Melting (HRM) Analysis.	One protocol was validated for the simultaneous detection and differentiation of Sheeppox virus vaccine strain from field isolates, Goatpox virus and Lumpy Skin Disease virus using real time HRM-based techniques.
Vaccines	
Title of activity	**Scope**
Development of a novel B-cell ELISPOT assay.	In vitro evaluation of B-cell antibody response to antigens, including vaccine candidates.

Evaluating innate immune responses to Lumpy Skin Disease virus (LSDV) in cattle.	A novel assay was developed to evaluate and compare the innate immune responses of LSDV vaccine candidates versus wild type viruses.
Analysis of antigen conservation and inactivation of gamma-irradiated avian influenza virus subtype H9N2.	To evaluate the effect of gamma-irradiation on influenza antigens used for vaccine preparation or diagnostic tests.

ToR : To propose or develop methods and procedures that facilitate harmonisation of international standards and guidelines applicable to the designated specialty

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the surveillance and control of animal diseases, food safety or animal welfare

Proposal title	Scope/Content	Applicable area
Organisation of laboratory proficiency testing for PPRV	Panels were sent to 30 laboratories in 26 countries for PPR virus and antibody detection	☒Surveillance and control of animal diseases ☐Food safety ☐Animal welfare

ToR: To establish and maintain a network with other OIE Collaborating Centres designated for the same specialty, and should the need arise, with Collaborating Centres in other disciplines

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

3. Did your Collaborating Centre maintain a network with other OIE Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Biotechnology-based Diagnosis of Infectious Diseases in Veterinary Medicine – National Veterinary Institute/Swedish University of Agricultural Science	Sweden	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East	multi-pathogens detection, avian influenza and Newcastle disease detection and rapid typing
Diagnostic Test Validation Science in the Asia-Pacific Region CSIRO Australian Animal Health Laboratory (AAHL)	Australia	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Diagnostic tests validation

4. Did your Collaborating Centre maintain a network with other OIE Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
OIE CC for Quality Control of Veterinary Vaccines, PANVAC	Ethiopia	☒Africa ☐Americas ☐Asia and Pacific ☐Europe ☐Middle East	Trainings and workshops, vaccines quality control.
OIE RL for Avian influenza and Newcastle disease, IZSVe Padova	Italy	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East	avian influenza and Newcastle disease detection and typing
OIE RL for Avian influenza, FLI	Germany	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East	avian influenza detection and typing
OIE RL for Brucellosis, IZS Teramo	Italy	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East	Training
OIE RL for Brucellosis, Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA)	Argentina	☐Africa ☒Americas ☐Asia and Pacific ☐Europe ☐Middle East	reference material, training
OIE RL for PPR, CIRAD	France	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East	Trainings, research and laboratory activities
OIE RL for PPR, National Diagnostic Center for Exotic Animal Diseases	China	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Trainings
OIE RL for FMD, National Institute of Animal Health	Thailand	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Training and laboratory activities

OIE RL for FMD, Lanzhou Veterinary Research Institute	China	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Training
OIE RL for Contagious bovine pleuropneumonia, BNVL	Botswana	☒Africa ☐Americas ☐Asia and Pacific ☐Europe ☐Middle East	Laboratory activities, quality control

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

5. Did your Collaborating Centre place expert consultants at the disposal of the OIE?

Yes

Name of expert	Kind of consultancy	Subject
Giovanni Cattoli	OFFLU, PPR-GREN	avian influenza, PPR
Gerrit J. Viljoen	OFFLU, PPR-GREN	avian influenza, PPR

ToR: To provide, within the designated specialty, scientific and technical training to personnel from OIE Member Countries

6. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by the OIE, to personnel from OIE Member Countries?

Yes
a) Technical visits: 61
b) Seminars: 0
c) Hands-on training courses: 40
d) Internships (>1 month): 8

Type of technical training provided (a, b, c or d)	Content	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
c	Training Course on of Transboundary Animal Diseases diagnosis:sequencing and bioinformatic analysis of animal pathogen genomes	Twenty-two participants (18 from Africa and 4 from Asia)	1

c	Group training on diagnosis and confirmation of selected animal diseases	Eight participants from Cambodia, Myanmar, Laos PDR and Vietnam	1
c	Advanced training on transboundary animal diseases diagnosis and molecular epidemiology	10 scientists (2 from Asia and 8 from Africa)	1
a	Rapid multi-pathogens detection assays for the early diagnosis of Transboundary Animal Diseases	Zambia	21
a	PCR-based laboratory assays for rapid animal pathogens detection	Bangladesh	12
a	Gene-based identification and characterization of animal pathogens including multiplex assays for animal and zoonotic disease diagnostic, sequencing and bioinformatics	Botswana	14
a	ELISA and LIPS technology for capripox and PPR surveillance	Ethiopia	9
a	Molecular methods for rapid detection of transboundary animal diseases (i.e. multiplex PCR), gene sequencing	Kenya	5
d	Laboratory assays for evaluation of immune response in animals, PCR-based methods, gene sequencing	Italy	1
d	Gene-based identification and characterization of animal pathogens including multiplex assays for animal and zoonotic disease diagnostic	Uganda	1
d	Gene-based identification and characterization of animal pathogens including multiplex assays for animal and zoonotic disease diagnostic	Mozambique	1
d	Gene-based identification and characterization of animal pathogens including multiplex assays for animal and zoonotic disease diagnostic	Lesotho	1
d	Development and validation of serological assay for capripox and PPR virus infections	Panama	1
d	Molecular techniques for the rapid detection and characterization of PPR virus	Bulgaria	2
d	Molecular techniques and molecular epidemiology used in the detection and typing of animal pathogens, with reference on animal pox viruses	Ethiopia	1

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

7. Did your Collaborating Centre organise or participate in the organisation of scientific meetings on behalf of the OIE?

Yes

National/International	Title of event	Co-organiser	Date (mm/yy)	Location	No. Participants
International	Inaugural Meeting of the PPR Global Research and Expertise Network (PPR-GREN)	FAO/IAEA	04/18	Vienna	60

ToR: To collect, process, analyse, publish and disseminate data and information relevant to the designated specialty

8. Publication and dissemination of any information within the remit of the mandate given by the OIE that may be useful to Member Countries of the OIE

a) Articles published in peer-reviewed journals: 17

1. Analysis of antigen conservation and inactivation of gamma-irradiated avian influenza virus subtype H9N2. Salehi B, Motamedi-Sedeh F, Madadgar O, Khalili I, Ghalyan Chi Langroudi A, Unger H, Wijewardana V. Acta Microbiol Immunol Hung. 2018 Apr 24:1-9. doi: 10.1556/030.65.2018.025.
2. Bovine monocyte derived dendritic cell based assay for measuring vaccine immunogenicity in vitro. Kangethe RT, Pichler R, Chuma FNJ, Cattoli G, Wijewardana V. Vet Immunol Immunopathol. 2018 Mar;197:39-48. doi: 10.1016/j.vetimm.2018.01.009.
3. Molecular characterization of avipoxviruses circulating in Mozambique, 2016-2018. Mapaco LP, Lacerda Z, Monjane IVA, Sussuro A, Viljoen GJ, Cattoli G, Dundon WG, Achá SJ. Arch Virol. 2018 May 8. doi: 10.1007/s00705-018-3864-0.[Epub ahead of print]
4. Phylogenetic Analysis of Pigeon Paramyxoviruses Type-1 Identified in Mourning Collared Doves (Streptopelia decipiens) in Namibia, Africa. Molini U, Aikukutu G, Khaiseb S, Cattoli G, Dundon WG. J Wildl Dis. 2018 Mar 29. doi:10.7589/2017-10-246. [Epub ahead of print]
5. Complete Genome Sequence of a Lineage II Peste des Petits Ruminants Virus from Sierra Leone.Dundon WG, Adombi CM, Kanu S, Loitsch A, Cattoli G, Diallo A. Genome Announc. 2018 Jan 4;6(1). pii: e01417-17. doi: 10.1128/genomeA.01417-17.
6. A gel-based PCR method to differentiate sheeppox virus field isolates from vaccine strains. Chibssa TR, Grabherr R, Loitsch A, Settypalli TBK, Tuppurainen E, Nwankpa N, Tounkara K, Madani H, Omani A, Diop M, Cattoli G, Diallo A, Lamien CE. Virol J. 2018 Apr 2;15(1):59. doi: 10.1186/s12985-018-0969-8.
7. Risk Factors for Avian Influenza H9 Infection of Chickens in Live Bird Retail Stalls of Lahore District, Pakistan 2009-2010. Chaudhry M, Rashid HB, Angot A, Thrusfield M, Bronsvoort BMD, Capua I, Cattoli G, Welburn SC, Eisler MC. Sci Rep. 2018 Apr 4;8(1):5634. doi: 10.1038/s41598-018-23895-1
8. Chibssa TR, Grabherr R, Loitsch A, Settypalli TBK, Tuppurainen E, Nwankpa N, Tounkara K, Madani H, Omani A, Diop M, Cattoli G, Diallo A, Lamien CE. Agel-based PCR method to differentiate sheeppox virus field isolates from vaccine strains. Virol J. 2018 Apr 2;15(1):59. doi: 10.1186/s12985-018-0969-8.
9. Molini U, Aikukutu G, Khaiseb S, Cattoli G, Dundon WG. Phylogenetic Analysis of Pigeon Paramyxoviruses Type-1 Identified in Mourning Collared Doves (Streptopelia decipiens) in Namibia, Africa. J Wildl Dis. 2018 Mar 29. doi:10.7589/2017-10-246.
10. Molini U, Aikukutu G, Khaiseb S, Haindongo NN, Lilungwe AC, Cattoli G, Dundon WG, Lamien CE. Molecular characterization of lumpy skin disease virus in Namibia, 2017. Arch Virol. 2018 Jun 4. doi: 10.1007/s00705-018-3891-x.

11. Wade A, Jumbo SD, Zecchin B, Fusaro A, Taiga T, Bianco A, Rodrigue PN, Salomoni A, Kameni JMF, Zamperin G, Nenkam R, Foupouapouognigni Y, Abdoulkadiri S, Aboubakar Y, Wiersma L, Cattoli G, Monne I. Highly Pathogenic Avian Influenza A(H5N8) Virus, Cameroon, 2017. Emerg Infect Dis. 2018 Jul;24(7):1367-1370. doi: 10.3201/eid2407.172120.
12. Wade A, Taïga, Fouda MA, MaiMoussa A, Jean Marc FK, Njouom R, Vernet MA, Djonwe G, Mballa E, Kazi JP, Nenkam R, Poueme Namegni R, Bamanga H, Casimir NKM, Lebreton M, Nwobegahay J, Fusaro A, Zecchin B, Milani A, Gaston M, Chepnda VR, Dickmu Jumbo S, Souley A, Aboubakar Y, Fotso Kamnga Z, Couo K, Atkam H, Dauphin G, Wiersma L, Bebay C, Nzietchueng S, Vincent T, Biaou C, Mbacham W, Monne I, Cattoli G. Highly pathogenic avian influenza A/H5N1 Clade 2.3.2.1c virus in poultry in Cameroon, 2016-2017. Avian Pathol. 2018 Jul 9:1-51. doi:10.1080/03079457.2018.1492087.
13. Bonfante F, Mazzetto E, Zanardello C, Fortin A, Gobbo F, Maniero S, Bigolaro M, Davidson I, Haddas R, Cattoli G, Terregino C. A G1-lineage H9N2 virus with oviduct tropism causes chronic pathological changes in the infundibulum and a long-lasting drop in egg production. Vet Res. 2018 Aug 29;49(1):83.
14. Capua I, Mercalli A, Romero-Tejeda A, Pizzuto MS, Kasloff S, Sordi V, Marzinotto I, Lampasona V, Vicenzi E, De Battisti C, Bonfanti R, Rigamonti A, Terregino C, Doglioni C, Cattoli G, Piemonti L. Study of 2009 H1N1 Pandemic Influenza Virus as a Possible Causative Agent of Diabetes. J Clin Endocrinol Metab. 2018 Dec 1;103(12):4343-4356.
15. Tounkara K, Bataille A, Adombi CM, Maikano I, Djibo G, Settypalli TBK, Loitsch, A, Diallo A, Libeau G. First genetic characterization of Peste des Petits Ruminants from Niger: On the advancing front of the Asian virus lineage. Transbound Emerg Dis. 2018 Oct;65(5):1145-1151. doi: 10.1111/tbed.12901.
16. Tshilenge GM, Dundon WG, De Nardi M, Mulumba Mfumu LK, Rweyemamu M, Kayembe-Ntumba JM, Masumu J. Seroprevalence of Rift Valley fever virus in cattle in the Democratic Republic of the Congo. Trop Anim Health Prod. 2018 Oct 22. doi:10.1007/s11250-018-1721-5.
17. Donduashvili M, Goginashvili K, Toklikishvili N, Tigilauri T, Gelashvili L, Avaliani L, Khartskhia N, Loitsch A, Bataille A, Libeau G, Diallo A, Dundon WG. Identification of Peste des Petits Ruminants Virus, Georgia, 2016. Emerg Infect Dis. 2018 Aug;24(8):1576-1578. doi: 10.3201/eid2408.170334.

b) International conferences: 8
1. Luka P.D., Shamaki D., Lamien C.E., Nyam D.C., Achenbach J.E., Jambo A.R., Yakubu B., Unger H. Experimental infection and direct blood detection of African swine fever in pigs. 4th Annual GARA Scientific Workshop, Cagliari-Sardinia, Italy, April 11-13, 2018

2. Luka P.D., Shamaki D., Mwiine F.N., Lamien C.E., Achenbach J.E., Erume J., Yakubu B., Unger H. Spatio-temporal emergence of several tetrameric repeats of African swine fever genotype I from Nigeria. 4th Annual GARA Scientific Workshop, Cagliari-Sardinia, Italy, April 11-13, 2018
3. V. Wijewardana, R.Kangethe, E.L. Sassu, R. Pichler, G. Cattoli. Dendritic cell based in-vitro assay to test immunogenicity of viral vaccine candidates. 11th International Congress for Veterinary Virology, Vienna, 27-30 August 2018.
4. W.G. Dundon, M. Donduashvili, K. Gioginashvili, N. Toklikishvili, T. Tigilauri, L. Gelashvili, L. Avaliani, N. Khartskhia, A. Loitsch, A. Bataille, G. Libeau, A. Diallo, G. Cattoli. Identification of Peste des Petites Ruminants, Georgia. 11th International Congress for Veterinary Virology, Vienna, 27-30 August 2018.
5. F.J. Berguido, E. Gelaye, K. Krstevski, A. Loitsch, L. Comtet, P. Pourqier, E. Tuppurainen, A. Diallo, G. Cattoli, C.E. Lamien. Evaluation of Capripox surface protein as antigens for the detection of antibodies using indirect ELISA. 11th International Congress for Veterinary Virology, Vienna, 27-30 August 2018.
6. T.B.K. Settypally, K. Tounkara, A. Loitsch, A. Diallo, G. Cattoli, C.E. Lamien. Syndromic surveillance and pathogens detection using multiplex assays for respiratory infections in small ruminants. 11th International Congress for Veterinary Virology, Vienna, 27-30 August 2018.
7. T.R. Chibssa, T.B.K. Settypally, F.J.Berguido, A. Loitsch, A. Diallo, G. Cattoli, C.E. Lamien. Differentiation of sheep pox virus vaccines from field isolates and other capripox species. 11th International Congress for Veterinary Virology, Vienna, 27-30 August 2018.
8. G.Cattoli, C.E.Lamien. Lumpy Skin Disease: an emerging animal disease in Europe. 1 oral presentation at the meeting of the European College of Bovine Health Management / 50th Congress Italian Association of Bovine Medicine, Italy, 11-13 October 2018.

c) National conferences: 0

d) Other
(Provide website address or link to appropriate information): 2
https://www-pub.iaea.org/books/iaeabooks/View_Newsletters/4/Animal-Production-and-Health-Newsletter
https://www.iaea.org/about/animal-production-and-health-section