

VetLab Network and PPR Realated Activities at the IAEA

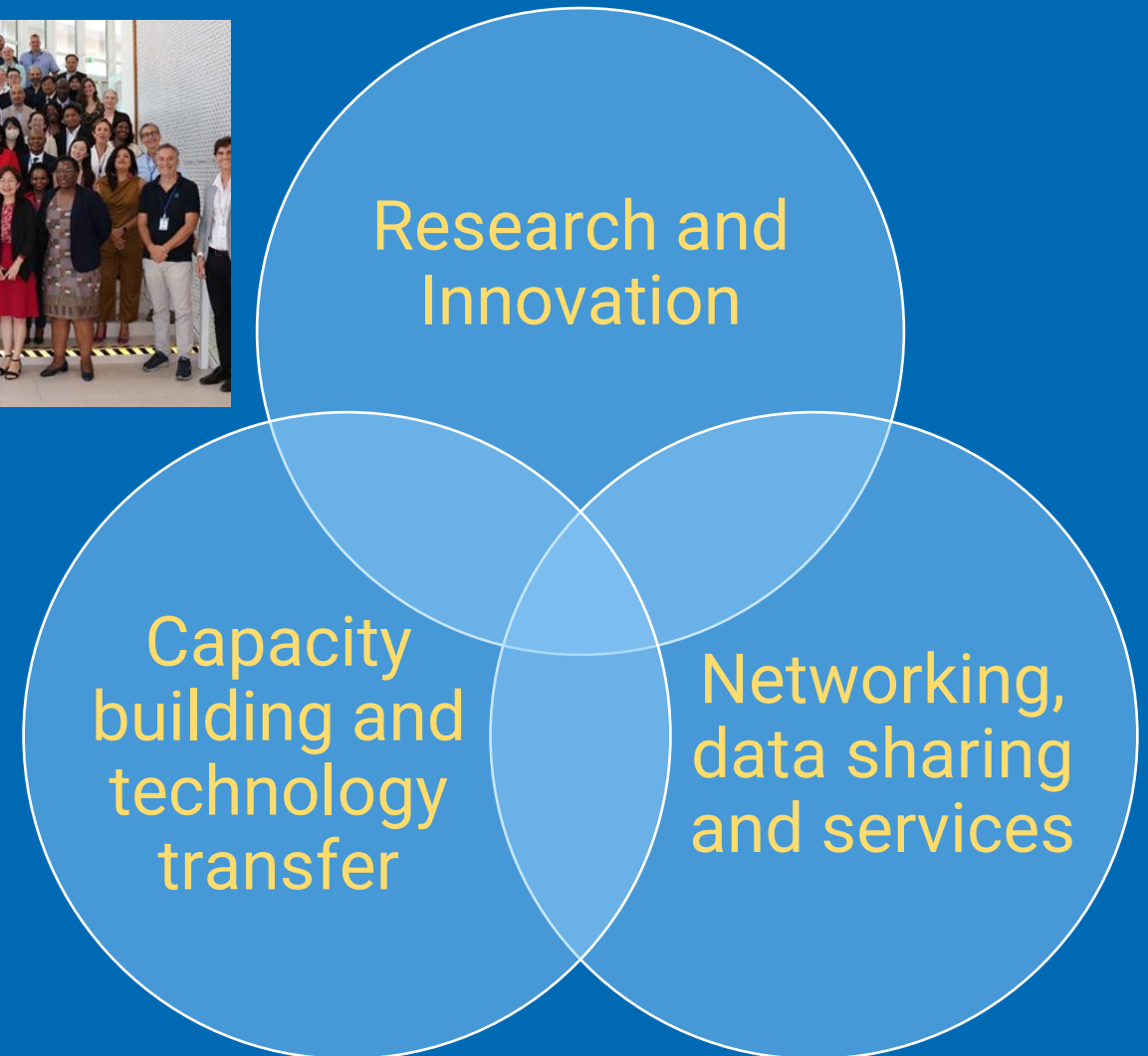
Viskam Wijewardana

Lab Head, Animal Production and Health Laboratory, Joint
FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture,
Department of Nuclear Sciences and Applications,
International Atomic Energy Agency



Veterinary Diagnostic Laboratory Network (VETLAB Network)

- Since 2012 strengthens the invisible infrastructure that prevents outbreaks from becoming disasters
- 46 African and 19 Asian countries
- Has trained nearly 500 scientists in 33 countries
- Service-based Sanger and Whole Genome Sequencing – more than 12000 sample submissions
- From support to partnerships – more than 10 assays developed validated



Building Expertise, Bridging Borders: Training and Technology for TADs & Zoonoses

Group Trainings



Detection and Characterization Training

Comprehensive 2-week training on major transboundary animal diseases and zoonoses in Vienna, Austria (Sept 2025)



Surveillance at High-Risk Interfaces

Regional training for diagnostic laboratory network partners in Phnom Penh, Cambodia (June 2025)



Advanced Sequencing Applications

Specialized training on next-generation and nanopore sequencing techniques in Vienna, Austria (Nov 2025)

Building Expertise, Bridging Borders: Training and Technology for TADs & Zoonoses

On-Site Technical Trainings

RCVS-BRIN, Indonesia

Nanopore Sequencing Applications for Detecting and Monitoring Zoonotic and Animal Diseases



NIAH, Thailand

Nanopore Sequencing Applications for Detecting and Monitoring Zoonotic Pathogens



SCVL, Mongolia

Nanopore Sequencing Applications for Detecting and Monitoring Zoonotic Pathogens



LANADA, Ivory Coast

Customized training in pathogen detection, including syndromic testing



Building Expertise, Bridging Borders: Training and Technology for TADs & Zoonoses

On-Site Technical Trainings **Irene ethi.William gini**

IAH, Ethiopia

Nanopore Sequencing Applications and cross species serology for Zoonotic Pathogens.



LCVD, Guinea

N

LCVB/LANADA, Ivory Coast

Nanopore Sequencing Applications for Detection and Surveillance of Zoonotic Pathogens.



CVL, Mozambique

Customized training in pathogen detection, including syndromic testing



PROVISION OF EQUIPMENT AND REAGENTS

Equipment Provision

Critical diagnostic equipment provided to veterinary laboratories in Tunisia and Ivory Coast, enhancing testing capabilities for transboundary animal diseases

Technical Maintenance

Specialized technical assistance for equipment maintenance in Ivory Coast, ensuring sustainable laboratory operations

Reagents & Supplies

Essential laboratory supplies distributed to 25 countries across Africa and Asia, supporting continuous diagnostic operations: Angola, Botswana, Burkina Faso, Cameroon, Eswatini, Ethiopia, Ghana, Guinea, Indonesia, Ivory Coast, Kenya, Lesotho, Mali, Mongolia, Morocco, Mozambique, Namibia, Nepal, Nigeria, Senegal, Sri Lanka, Tanzania, Thailand, Tunisia, Zambia

RAPID RESPONSES TO DISEASE OUTBREAKS AND LABORATORY PREPAREDNESS



Avian Diseases

Ethiopia



ASF and Swine Diseases

Nigeria and Tanzania



Pox Diseases

Burkina Faso and Tunisia (LSD), and Cameroon (mpox)



Small Ruminant Diseases

PPR in Sri Lanka and CCPP in Mongolia

Pathogen Characterization and Diagnostic Support



Avian Influenza & Other Avian Viruses

Burkina Faso, Cameroon, Ethiopia, Ivory Coast, Kenya, Mauritania, Mozambique, Namibia, Nepal



Rabies Virus

Bangladesh, Cameroon, Kenya



LSDV & Ruminant Poxviruses

Ivory Coast, Namibia, Nigeria, Tunisia



Monkeypox Virus

Cameroon



ASFV & Swine Viruses

Cameroon, Mongolia, Tanzania



PPRV & MCCP

Cameroon, Mongolia, Nepal



Rift Valley Fever Virus

Botswana, Kenya, Mauritania



Metagenomics

Bangladesh, Cameroon, Guinea, Mauritania, Mozambique, Sri Lanka, Tanzania, Vietnam

Advanced diagnostic support provided to 18 countries, enabling accurate pathogen identification and characterization for effective disease control and epidemiological understanding

Laboratory Network Support and Knowledge Exchange

Information Exchange & Coordination

VETLAB Bulletin

Country contributions from Bangladesh, Cameroon, Ethiopia, Kenya, Namibia, Thailand, Tunisia

Coordination Meeting

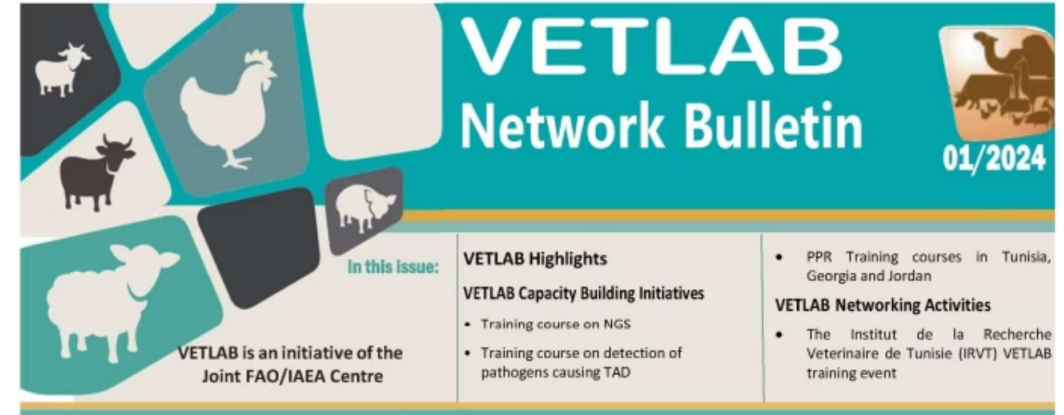
Ninth joint coordination meeting for Africa and Asia (August 2025)

Proficiency Testing

PT 2025 completed to ensure diagnostic quality

iVetNet Platform

Information platform supporting ISO 17025 implementation



QA/QC

Date

Short description

Performing reason

Issued document

Attach Documents

Status

Reviewed by

Approved by

Comment

QA/QC

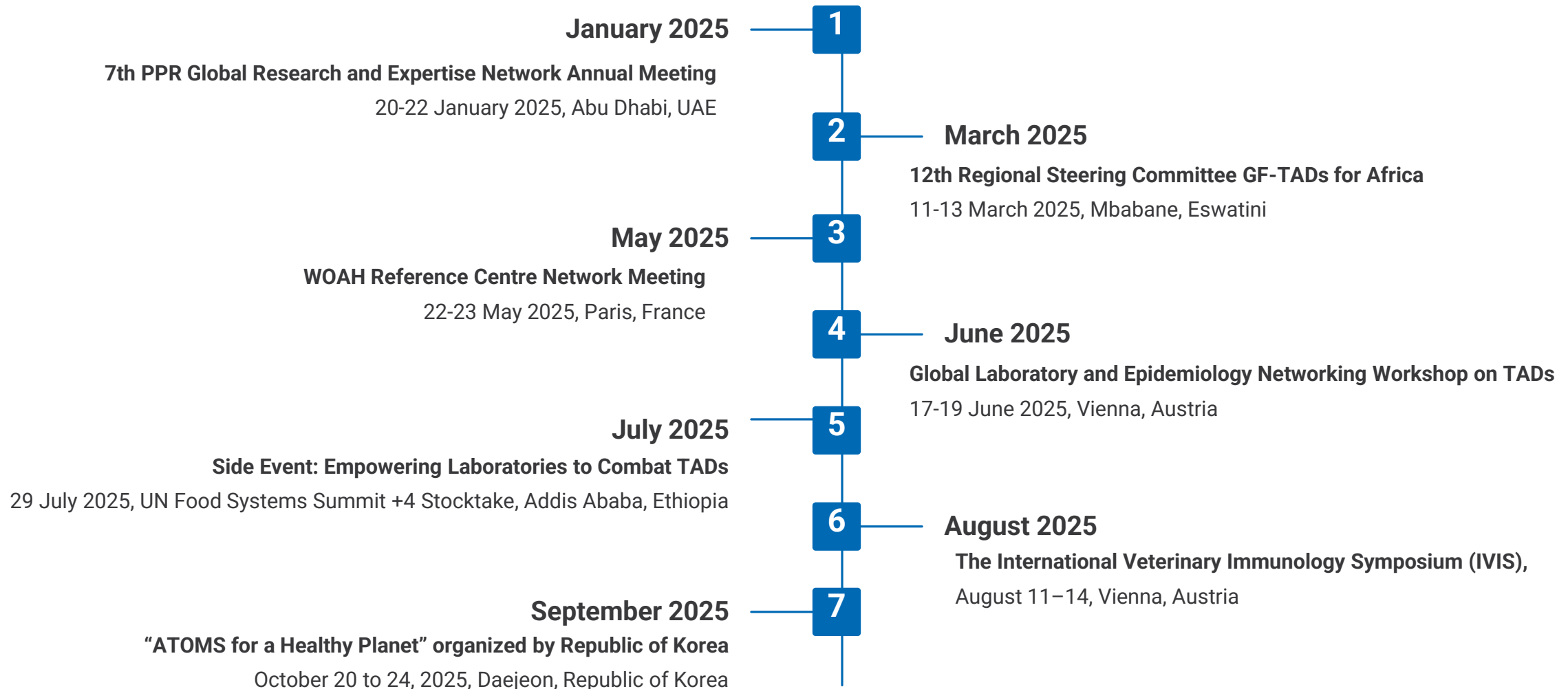
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Global Engagement and Strategic Partnerships

Expanding the VETLAB Network's influence through key international forums and events



LABORATORY CAPACITY HIGHLIGHTS

Advancing Molecular Diagnostic Skills

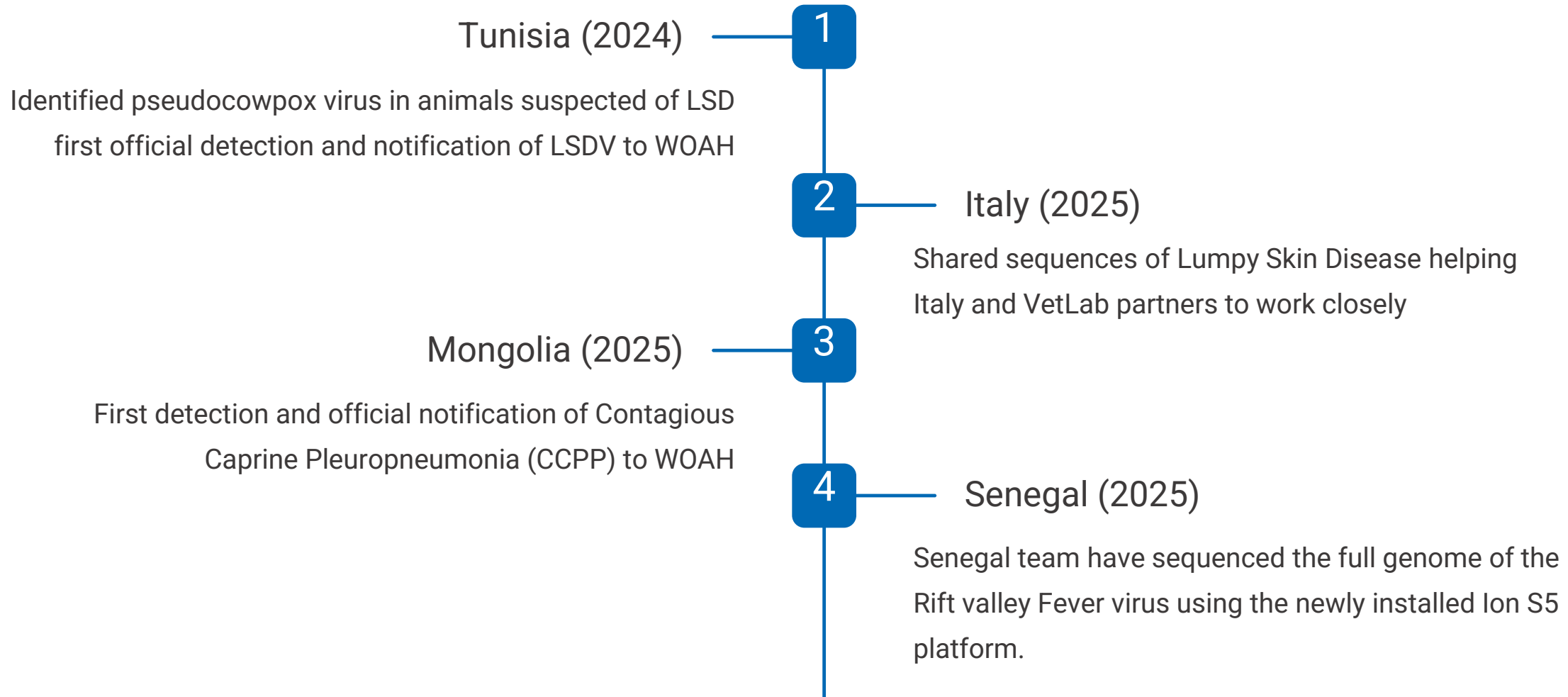
Partner laboratories are steadily enhancing their molecular diagnostic capabilities through sustained capacity-building initiatives and technical support

Adoption of Advanced Techniques

- **Multiparametric detection:** Abortifacient agents and pox disease diagnostics in Ivory Coast
- **Viral family assays:** Implemented in Thailand, Indonesia, Vietnam, and Mongolia
- **Environmental surveillance:** Successfully deployed in Thailand, Indonesia, Vietnam, Mongolia, Nepal, Sri Lanka, and Myanmar
- **Genomic characterization:** Comparative genomic analysis of African Swine Fever Virus isolates in Thailand

These advances represent significant progress in diagnostic capabilities, enabling more comprehensive disease surveillance and faster response times to emerging threats across the network.

Early Diagnosis Success Stories: Enabling Rapid Response



Laboratories Serving as Training Centers to Strengthen Regional Capacities

1

June 2025

LANAVET, Cameroon

Hosted a comprehensive 2-week training course on Vaccine Quality Control

2

April 2025

AHI, Sebeta, Ethiopia

Coordinated a regional training program focused on harmonizing laboratory tests and procedures for TADs.

3

January 2025

IRVT, Tunisia

Welcomed two veterinary laboratory technicians from Benin for a one-month intensive internship on advanced diagnostic techniques and laboratory management practices.

RECENT SCIENTIFIC CONTRIBUTIONS

Zoonotic Implications of the Co-Circulation of Clade 2.3.4.4b and 2.3.2.1a H5N1 Avian Influenza Viruses in Nepal in 2023

by Pragya Koirala ¹ , Manju Maharjan ² , Sharmila Chapagain ³ , Barun K. Sharma ¹ ,
Tirumala B. K. Settypalli ⁴ , Charles E. Lamien ⁴  and William G. Dundon ^{4,*} 

Detection and characterization of avian influenza H9N2 in a broiler farm in mauritania; 2024

Abdellahi Diambar Beyit¹ · Barry Yahya¹ · Meina Hasni Ebou^{1,2} · Lemrabott Ould Mekhalla¹ ·
Mohamed Lemine Haki¹ · Fatimetou Bounenne N'diay¹ · Doumbia Baba³ · Habiboullah Habiboullah³ ·
Doudou Mademba Diop⁴ · Tirumala Bharani Kumar Settypalli⁵ · Charles E. Lamien⁵ · William G. Dundon⁵

First Molecular Characterization of Sheep Pox Viruses in Northern Ghana, 2023

by Theophilus Odoom ^{1,2,*} , Richard Kwamena Abbiw ³ , David Livingstone Mawuko Blavo ⁴ ,
Sherry Ama Mawuko Johnson ^{2,*} , Patrick Ababio ¹ , Spencer Dugbartey ⁴ , Irene K. Meki ⁵ ,
Tirumala B. K. Settypalli ⁵ , William G. Dundon ⁵  and Charles E. Lamien ⁵ 

Case Report: Molecular characterization of rabies virus transmitted from a dog to a bull in a livestock market in Ghana

Theophilus Odoom^{1,2,*}, Richard Kwamena Abbiw³,
Joseph Kofi Abuh⁴, Emmanuel Allegye-Cudjoe⁴,
Sherry Ama Mawuko Johnson^{2,*}, William Tasiame⁵,
Daniel Arthur¹, Benita Anderson⁴, Tirumala B. K. Settypalli⁶,
Charles E. Lamien⁶ and William G. Dundon⁶

First detection of Lumpy Skin Disease virus in Tunisia

Selma Mejri^{1,2,*}, Saida Emna Ayari Fakhfakh^{1†}, Makrem Ourabi³,
Amira Abid⁴, Rahma Zaghouni⁵, Marouène Nouassri⁶,
Samir Mhiri⁷, Sahbi Gallah⁷, Nouha Habboubi⁵, Kaddour Hosni⁶,
Noura Abidi⁸, Nadia Braiki⁹, Wiem Mouelhi¹⁰,
Imed Ben Slimene¹⁰, Ines Ghodhbene⁴, Hager Mhamdi¹¹,
Mansour Ksontini¹², Zoubeida Landolsi¹³, Nesrine Zribi¹⁴,
Mohamed Hamdouni⁴, Hayet Gamdou¹⁰, Fethi Zammel⁶,
Arbi Hlel⁵, Nahed Ben Harrath⁶, Sihem Sbai⁶, Sara Thabet¹,
Hatem Ouled Ahmed¹⁵, Soufien Sghaier¹⁶, Roukaya Khorchani¹⁷,
Tirumala Bharani Kumar Settypalli¹⁸, Irene Kasindi Meki¹⁸,
Charles Euloge Lamien¹⁸ and Aida Tlatli¹⁹

Characterization of African swine fever virus in Angola, 2024

Samo Daniel¹ · Ana Paula D. Moraes² · Irene K. Meki³ · Tirumala B. K. Settypalli³ · Charles E. Lamien³ ·
Gottlieb Aikukutu⁴ · Siegfried Khaiseb⁴ · William G. Dundon^{3,5} · Juliet Kabajani⁴

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Communication

Farming Practices, Biosecurity Gaps, and Genetic Insights into African Swine Fever Virus in the Iringa and Ruvuma Regions of Tanzania

Agathe Auer^{1,2,*} , Anderson Samwel Yohana^{3,†}, Tirumala B. K. Settypalli¹ , Raphael Sallu⁴, Jelly Chang'a³,
Stella Bitanyi³, Stella Gaichugi Kiambi⁴, Irene K. Meki¹ , William G. Dundon¹ , Artem Metlin²,
Andriy Rozstalnyy², Geoffrey Hallan Mbata³, James Anset Okachu³, Henry Magwisha⁴, Sauda Ally Hamis³,
Jeremia Theodos Choga⁵, Stela Lucas Chalo⁵, Joshua Kimutai⁶, Gerald Misinzo⁷ , Solomon Wilson Nong'ona^{5,†},
Joseph Edmund Lyimo⁵ and Charles E. Lamien¹ 

Wiley
Transboundary and Emerging Diseases
Volume 2025, Article ID 5396237, 14 pages
<https://doi.org/10.1155/tbed/5396237>

WILEY

Research Article

Detection of African Swine Fever Virus Genotype II in West Africa (2020) and Its Co-Circulation With Endemic Genotype I: Implications for Pig Production

Irene Kasindi Meki¹ , Adeyinka Jeremy Adedeji^{2,3} , Lalidia Bruno Onoba^{4,5} ,
Yao Mathurin Koffi⁶ , Adama Diakité⁷, Tirumala B. K. Settypalli⁸ ,
Lamouni Habibata-Zerbo⁴, Kouamé Valère Kouakou⁶, Mohamed Adama Diakité⁹,
Charles Masembe¹⁰, Moctar Sidi^{4†}, Thierry Ouattara Douyeni⁶, Fatoumata Dembelé⁷,
Helen E. Luka², Sandoago Hamidou-Ouandaogo⁴, Christiane Dembelé⁷, Rebecca Weka¹¹ ,
Gregorie Bazimo⁴, Martin Dakouo¹², Toyin A. Olubade¹³, Mariétou Guitti-Kindo⁴,
Chaka Traoré⁷, Olushola Gamra², Dominique Guigma⁴, Cheick Abou Kounta Sidibé¹⁴ ,
Dupe A. Hambolu¹⁵ , Drabo Dji-tombo Adama⁴, Boubacar Madio dit Aladiogo Maiga¹⁶ ,
Mary A. Ogunleye¹⁷ , Ayokanmi Toluhi¹⁸ , Nanven Maurice⁷,
Emmanuel Couacy-Hymann¹⁹, Pam D. Luka²⁰ , Giovanni Cattoli^{21,10} and
Charles E. Lamien²² 

Berguido et al. *Virology Journal* (2024) 21:335
<https://doi.org/10.1186/s12985-024-02602-9>

Virology Journal

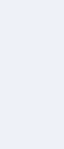
RESEARCH

Open Access



Development of a luminex-based assay for the detection of anti-capripoxvirus and rift valley fever virus antibodies in domestic ruminants

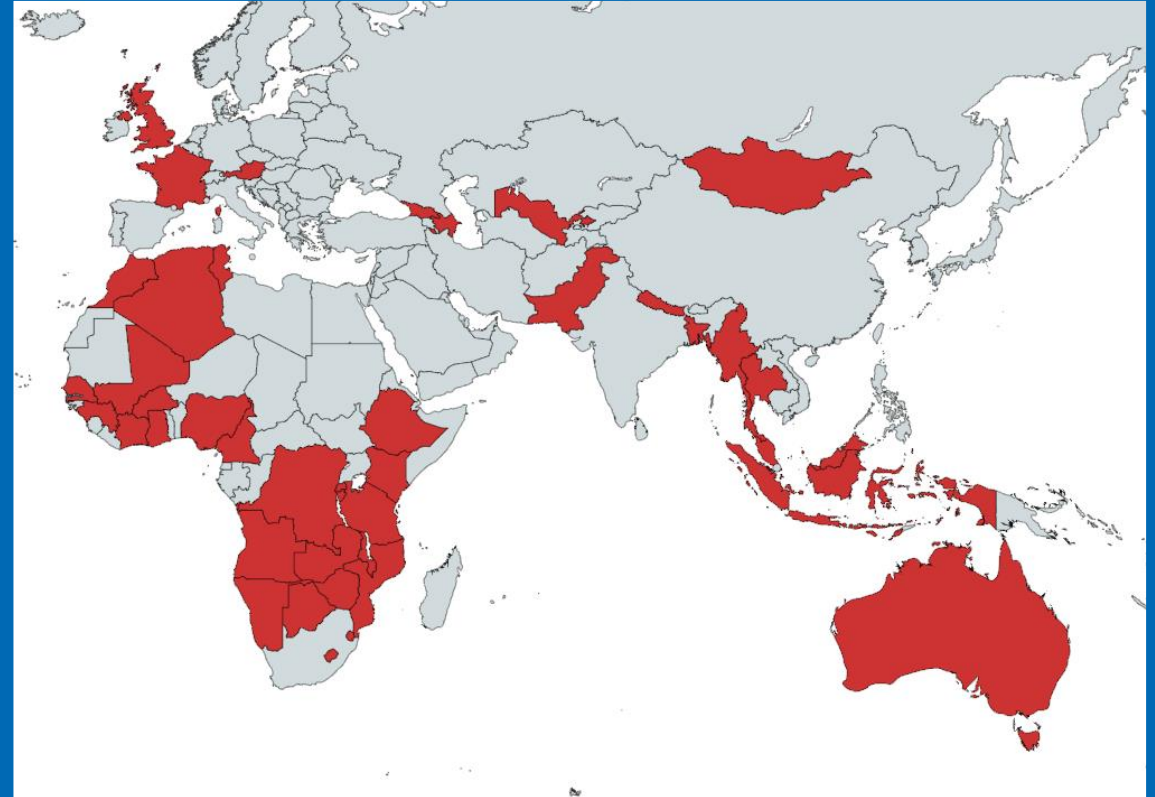
Francisco J. Berguido^{1,2†}, Tirumala Bharani Kumar Settypalli³, Curé Georges Tshilenge Mbuyi³,
Mame Thierno Bakhom⁴, Petrus Jansen van Vuren^{5,6}, Janusz T. Pawęska⁷, Giovanni Cattoli¹,
Reingard Grabherr² and Charles Euloge Lamien¹



PPR-related activities 2025

• *Interlaboratory Comparison Test - 2025*

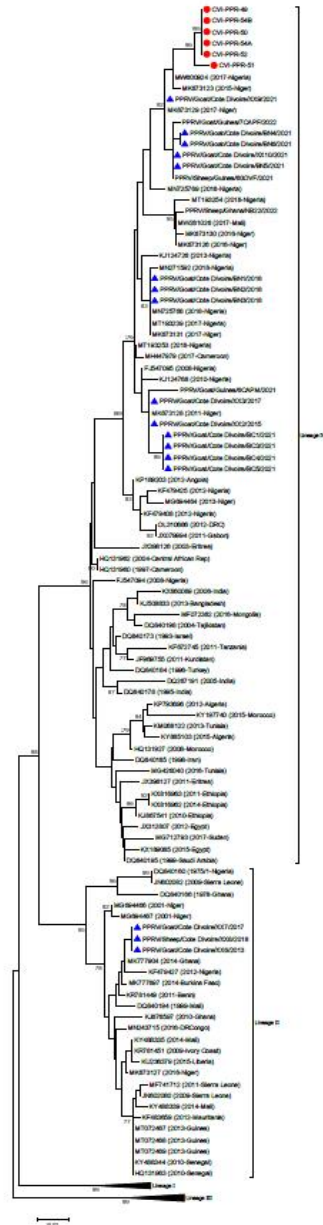
- 52 laboratories have confirmed interest
- Panels prepared (n=7 serological 7 samples & n=7 molecular samples)
- Received 32 responses to date
- Final report 1st quarter 2026



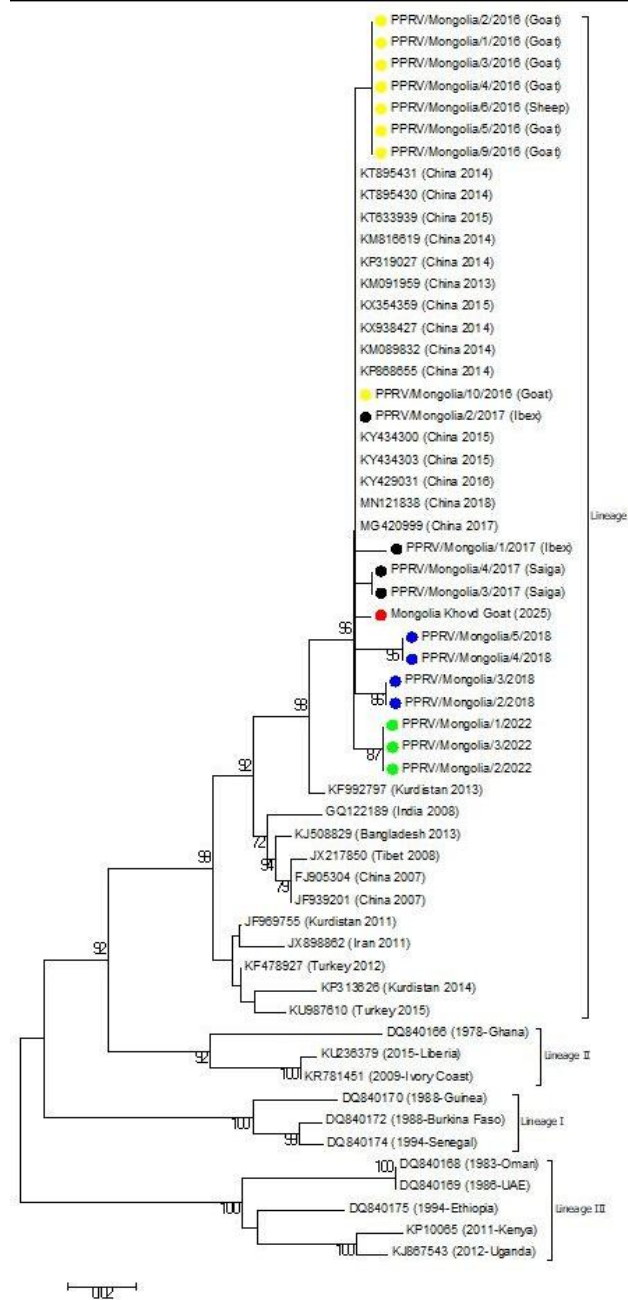
Support on the molecular epidemiology of PPRV

Samples received

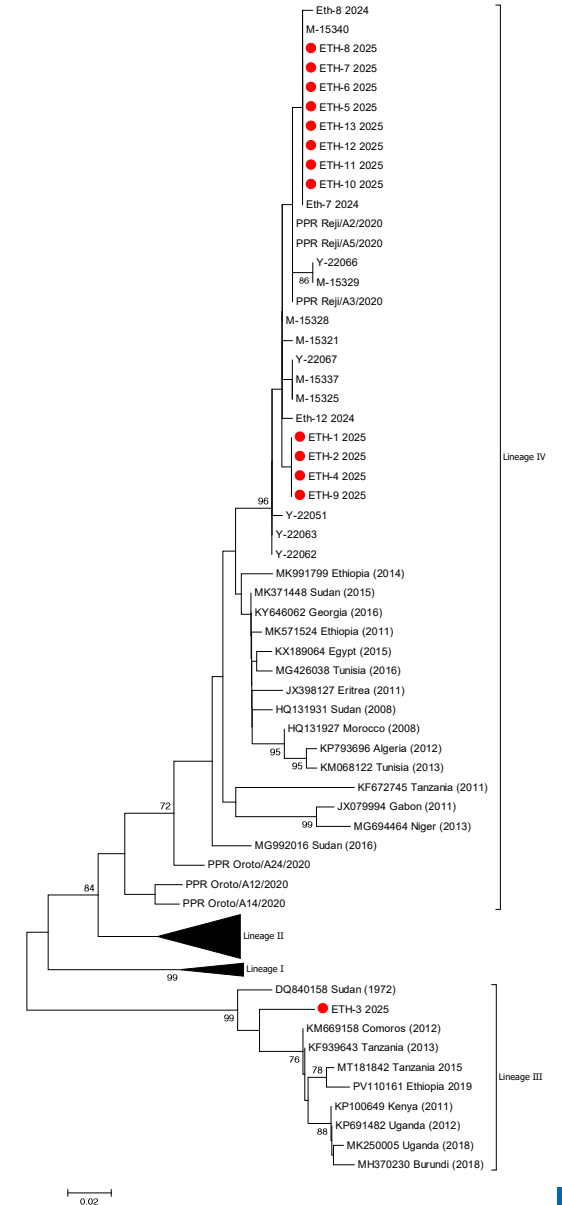
Mongolia	n=1	Lineage IV
Ethiopia	n=13	Lineage IV (n=12) and Lineage III (n=1)
Cote d'Ivoire	n=9	Lineage IV (n=6) and Lineage II (n=3)
Sri Lanka	n= 16	No PPRV detected



Cote D'Ivoire



Mongolia



Ethiopia

On-line presentations

SAARC Regional Training On “Molecular Diagnosis and Laboratory Surveillance of PPR”

(14-18 July 2025) Kathmandu, Nepal

Presentation: Laboratory capacity building in support of PPR eradication and technology transfer
the VETLAB Network

Joint Workshop of the GF-TADs West Eurasia for Foot and Mouth Disease and Peste des Petits Ruminants Regional Roadmaps 11-13 November 2025
Dushanbe, Tajikistan

Presentation: PPR diagnostic support from FAO/WOAH Reference Centre to countries in Central Asia

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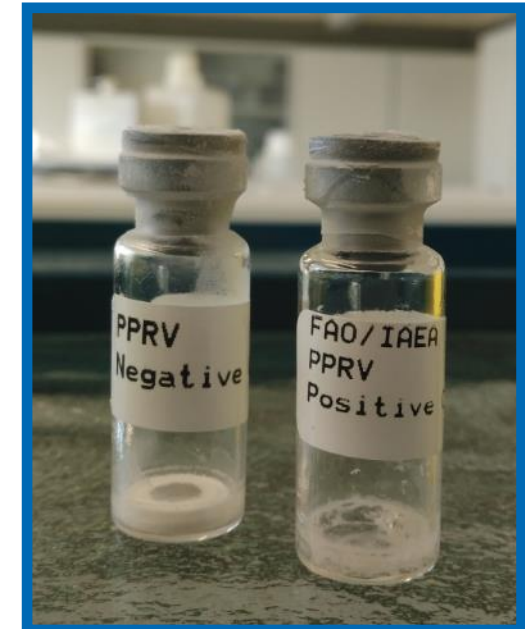
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Dushanbe, Tajikistan

Presentation: PPR diagnostic support from FAO/WOAH Reference Centre to countries in Central Asia

Harmonizing approach to PPR and small respiratory diseases laboratory diagnoses

- Distribution of laboratory SOPs from international reference laboratories or from the Animal Production and Health Laboratory (CJN, FAO/IAEA)
- Distribution of positive PPRV RNA controls upon request
- Inter-laboratory comparison test for PPRV (Serology and Molecular)





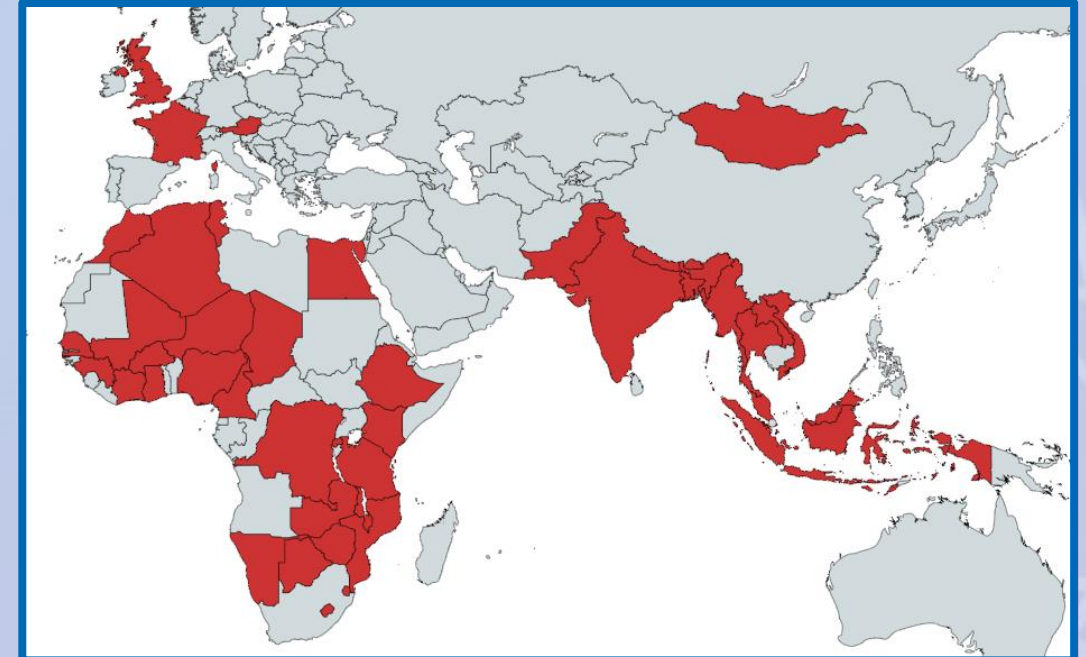
Thank You

V.Wijewardana@iaea.org

Interlaboratory Comparison Test - 2024

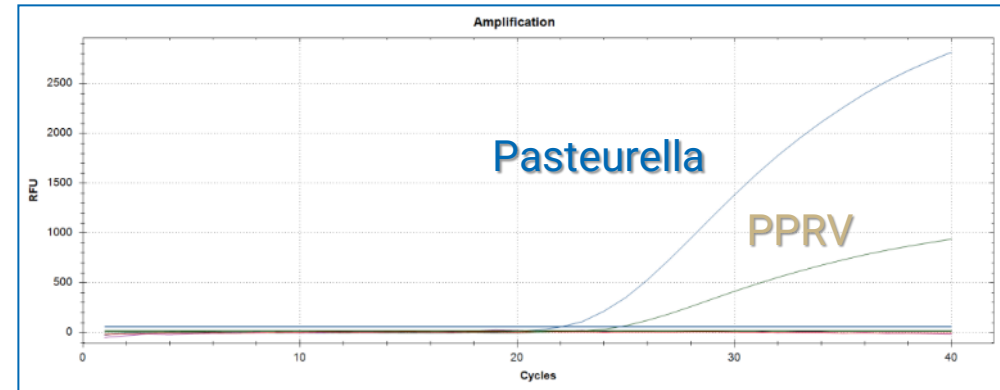
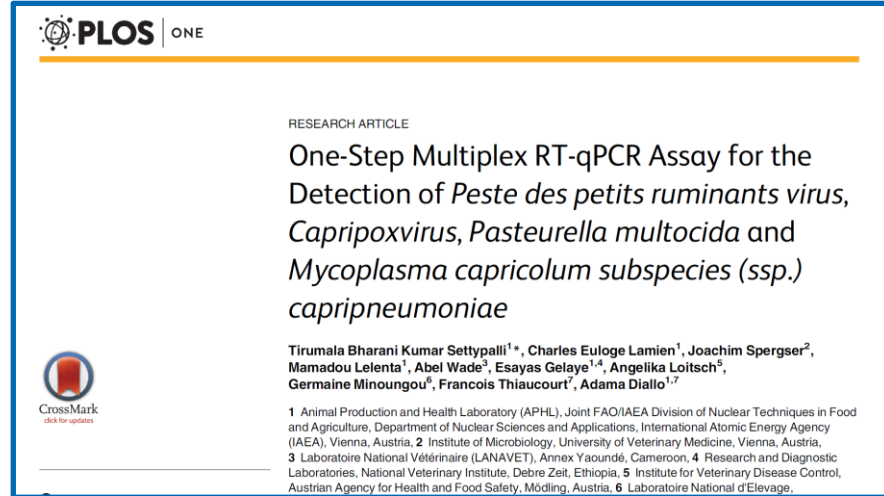
Country
Guinea
Uzbekistan
Georgia
Malawi
Rwanda
Zimbabwe
India
Pakistan
Nigeria
Algeria
Azerbaijan
Morocco Meknes
Morocco Marrakech
Bangladesh
Botswana
Burkina Faso I
Armenia
France (CIRAD)
Chad
Côte d'Ivoire
DRC
Eswatini
Ethiopia (AHI)
Ethiopia
Ghana
Indonesia (Harimurti)
Tanzania (Arusha)
Kenya
Lao P.D.R.
Lesotho
Malaysia I
Mali
Mongolia
Morocco (Rabat)

Country
Mozambique
Myanmar (Yangon)
Myanmar (Mandalay)
Namibia
Nepal
Niger
Senegal
Sri Lanka
Thailand (NIAH)
Tunisia
Tanzania
Viet Nam
Zambia
Austria
UK
Cameroon Garoua
Cameroon Douala
Cameroon Yaounde
Cameroon Bafoussam
Burkina Faso II
Malaysia II
Morocco Casablanca
Morocco (Tangier)
Bhutan
Egypt
Bangladesh II

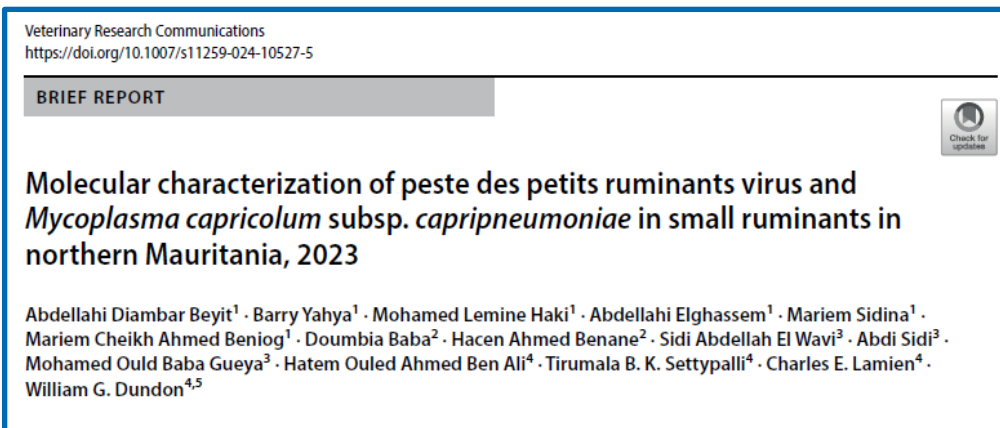
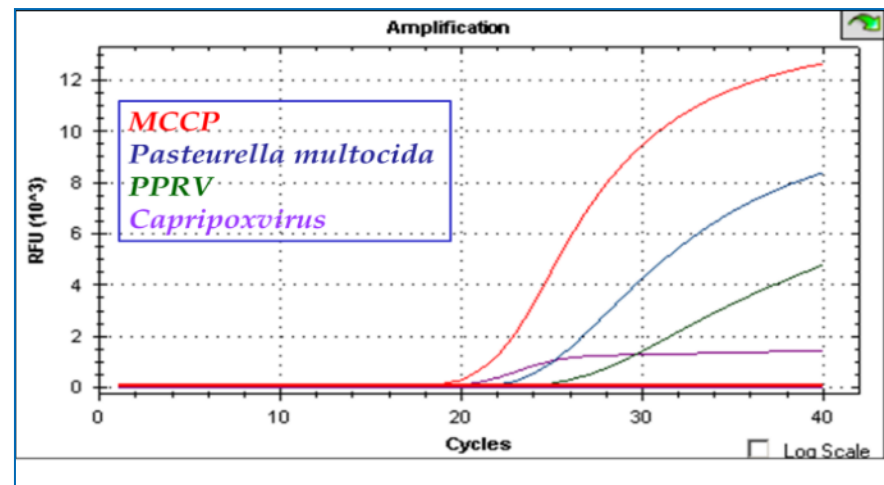


Joint FAO/IAEA Programme
Nuclear Techniques in Food and Agriculture

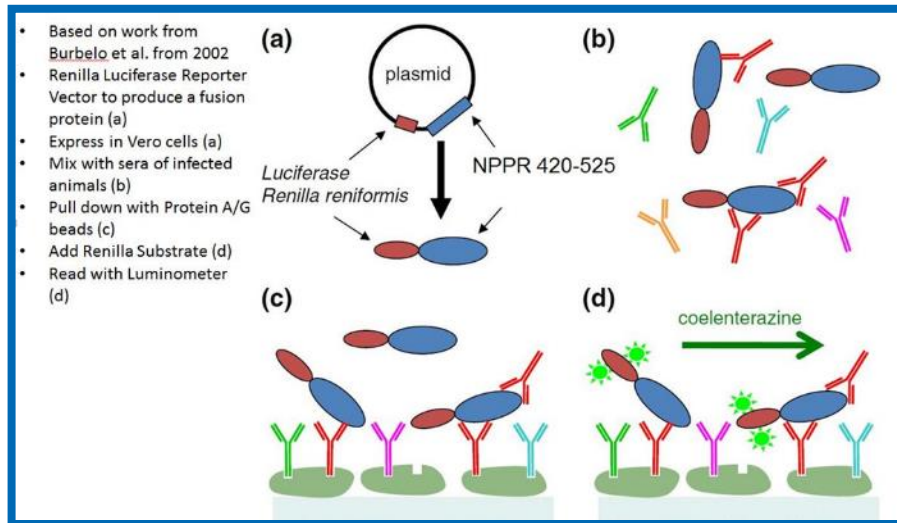
APHL R&D ACTIVITIES ON PPR: Differential diagnosis



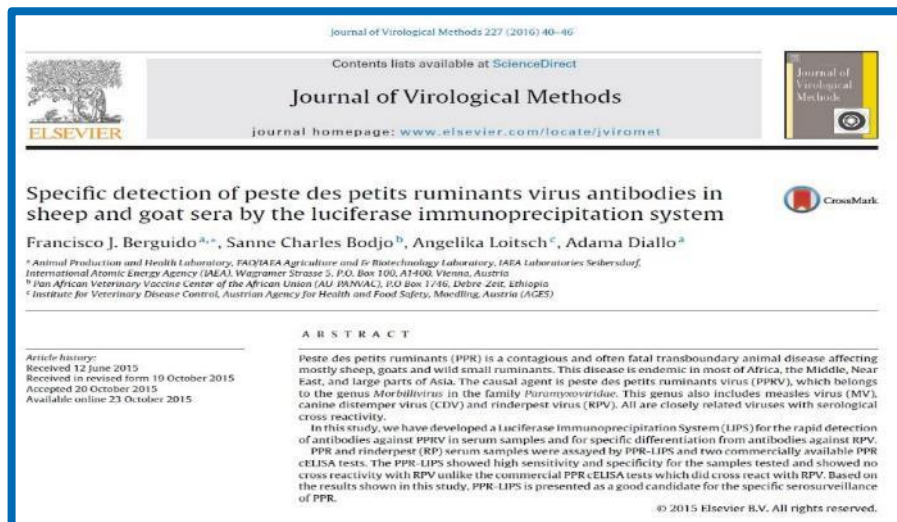
Detection of co-infection in swab sample collected from a goat in Burkina Faso



Luciferase Immuno Percipitation System (LIPS)

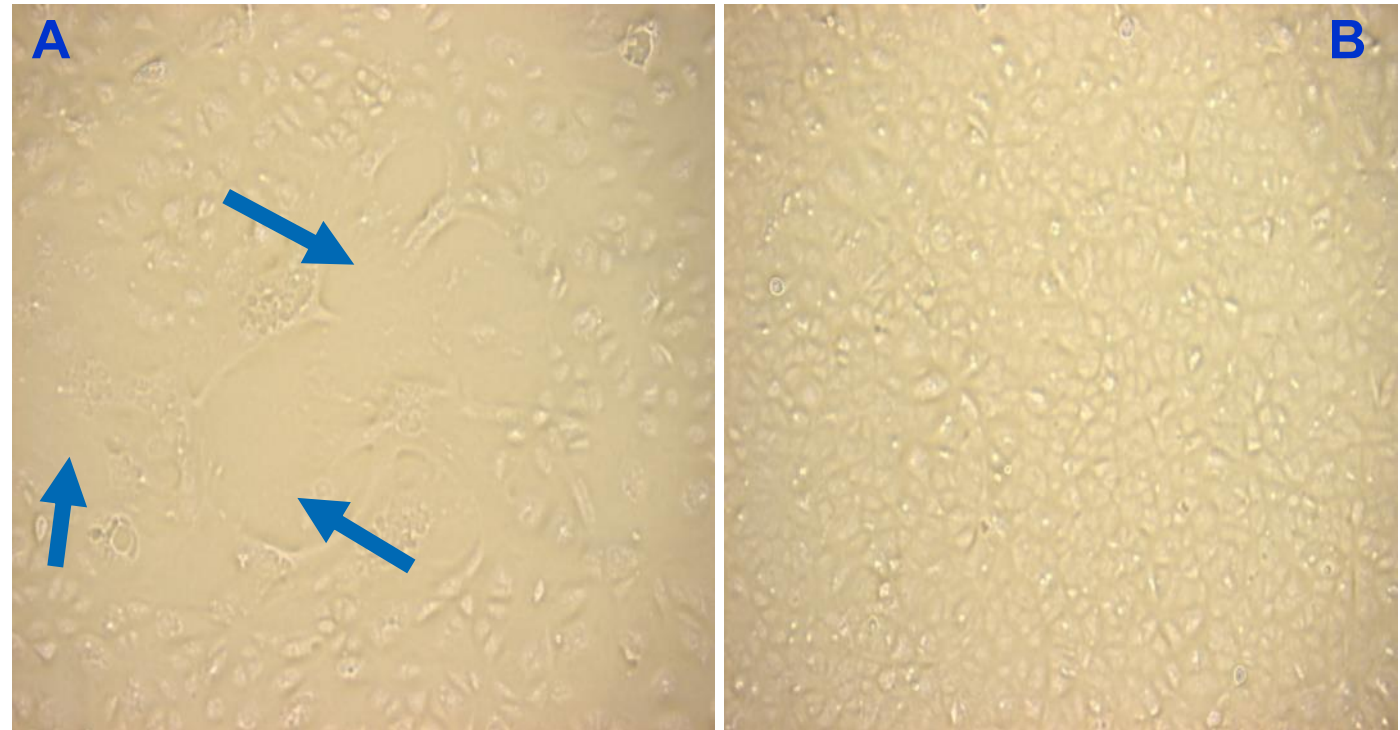
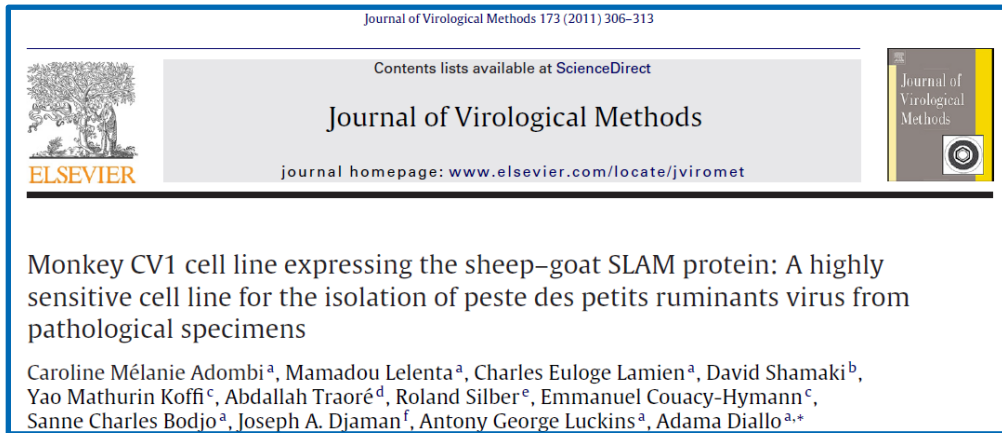


- Validated using field and experimental sera
- Can be used for multiple species
- LIPS is as sensitive as cELISA
- Uses 1 µl per reaction (useful for wildlife screening)



APHL R&D ACTIVITIES ON PPR: viral isolation

APHL developed and distributed CV1 Cell line expressing sheep SLAM to facilitated viral isolation



PPRV *in vitro* Isolation

Cell lines for the improved isolation of PPRV from diagnostic samples

Table 2

Results of the PPRV isolation trial on cell culture from the pathological specimens that were tested PPRV positive by classical and quantitative RT-PCR. CHS-20, CV1 and Vero were used in this trial.

Tissue	Sample ID	PPRV RT-PCR result on tissue sample	Virus isolation ^a			Detection of PPRV in cell culture supernatant (RT-PCR)		
			CHS-20	CV1 ^b	Vero ^b	CHS-20	CV1	Vero
Lung	NIG/08-03	+	3 days	N	N	+	—	—
	NIG/08-17	+	8 days	N	N	+	—	—
	NIG/08-27	+	2 days	N	N	+	—	—
	NIG/08-43	+	2 days	N	N	+	+	+
	CIV/09-OVP	+	N	N	N	—	—	—
	CIV/09-01P	+	1 day	N	N	+	+	— ^c
	CIV/09-02P	+	2 days	N	N	+	—	—
Lymph node	NIG/08-04	+ ^d	N	N	N	—	—	—
	NIG/08-10	+ ^d	7 days	N	N	+	—	—
	NIG/08-30	+	3 days	N	N	+	—	—
	CIV/09-OVG	+	N	N	N	—	—	—
	CIV/09-01G	+	2 days	N	N	+	— ^c	—
Liver	NIG/08-20	+	N	N	N	—	—	—
	NIG/08-28	+	5 days	N	N	+	—	—
	NIG/08-44	+	8 days	N	N	+	—	—
	CIV/09-OVF	+	N	N	N	—	—	—
	CIV/09-01F	+	N	N	N	—	—	—
	CIV/09-02F	+	4 days	N	N	+	—	—
Spleen	NIG/08-11	+ ^d	10 days	N	N	+	—	—
	NIG/08-18	+	10 days	N	N	+	—	—
	NIG/08-22	+	8 days	N	N	+	—	—
	NIG/08-29	+	7 days	N	N	+	—	—
	CIV/09-OVR	+	N	N	N	—	—	—
	CIV/09-01R	+	N	N	N	—	—	—
Kidney	CIV/09-02R	+	N	N	N	—	—	—
	CIV/09-02N	+	N	N	N	—	—	—

N – no CPE. Samples in bold were used in the RT-PCR shown in Fig. 3.

^a Day post infection (dpi) on which the CPE was detected in the cell monolayer.

^b Up to 4 blind passages were performed.

^c Positive for the RNAs that were extracted from the cells at the time of the first blind passage.

^d Positive in real time PCR only.

Support on the molecular epidemiology of PPRV - Publications

Year	Country	Publication
2014	Ghana	Dundon et al (2014) Virus Genes 49:497-501
2015	Kenya	Dundon et al (2017) Transboundary and Emerging Diseases 64:644-650
2015	Nigeria	Woma et al (2016) Transboundary and Emerging Diseases 63 :235-42
2016	Benin	Adombi et al (2017) Transboundary and Emerging Diseases 64:1037-1044
2016	Liberia	Boussini et al (2016) Tropical Animal Health and Production 48:1503-7.
2017	Mongolia	Shatar et al (2017) Archive of Virology 162:3157-3160
2018	Georgia	Donduashvili et al (2018) Emerging Infectious Diseases 24:1576-1578
2019	Burundi	Niyokwishimira et al (2019) Transboundary and Emerging Diseases 66:2067-2073
2019	Nepal	Pandey et al (2019) Virusdisease. 30:315-318
2019	Ethiopia	Rume et al (2019) Veterinary Microbiology 235:229-233
2019	DR Congo	Tshilenge et al (2019) Veterinary Microbiology
2019	Niger	Souley et al (2019) Transboundary and Emerging Diseases
2022	Ghana, Burkina Faso, Cote D'Ivoire, Guinea	Couacy et al (2023) Animals
2024	Mauritania	Beyit et al (2024) Vet Res Commun

Support to the molecular characterization of PPRV - Genomes

Year	Lineage	Country	GenBank
1969	I	West Africa	KP789375
1969	II	Benin	KR781450
2008	IV	Bangladesh	MG581412
2009	II	Côte d'Ivoire	KR781451
2010	II	Ghana	KJ466104
2011	II	Benin	KR781449
2011	II	Sierra Leone	MF741712
2011	III	Kenya	KM463083
2011	IV	Ethiopia	MK991798
2012	II	Nigeria	KR828814
2013	IV	Nigeria	KR828813
2014	IV	Ethiopia	MK991799
2015	II	Liberia	KU236379
2016	IV	Mongolia	KY888168
2017	III	Burundi	MK686066
2017	IV	Ethiopia	MK991800
2021	IV	Bhutan	N/A
2022	IV	Côte d'Ivoire	N/A
2022	IV	Nigeria	N/A
2022	IV	Ghana	N/A
2022	IV	Tunisia	N/A
2023	IV	Mauritania	OR500606
2024	IV	Nepal	PV167795