

WOAH Collaborative Centre Reports Activities 2023

Activities in 2023

This report has been submitted : 12 juillet 2024 09:52

Centre Information

Title of WOA Collaborating Centre	New and Emerging Diseases
Address of WOA Collaborating Centre	5 Portarlington Road East Geelong Victoria 3219 Australia
Tel.:	+61-3 52 27 50 00
E-mail address:	debbie.eagles@csiro.au
Website:	https://www.csiro.au/en/about/facilities-collections/acdp
Name Director of Institute (Responsible Official):	Debbie Eagles, Director, Australian Centre for Disease Preparedness
Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):	Debbie Eagles, Director, Australian Centre for Disease Preparedness
Name of the writer:	Debbie Eagles

TOR1 AND 2: SERVICES PROVIDED

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

Category	Title of activity	Scope
Disease control (true)	Vector competency of Australian species of Culicoides for African Horse Sickness	Identify potential AHSV competent Australian Culicoides sp. Develop high quality genomic resources of Culicoides spp. Genetic basis for vector competency
Epidemiology, surveillance, risk assessment, (true)	International EID preparedness and emerging disease surveillance	To augment existing wildlife interface emerging infectious disease preparedness in Southeast Asia. Incorporating advanced epidemiological techniques and innovative non-invasive sample collection methods.
Zoonoses (true)	Towards better pandemic preparedness and prevention – determining the epidemiological drivers of infectious disease emergence and transmission at the wildlife-livestock-human interface	To better understand and identify viral EIDs at spillover risk interfaces in South-East Asia
Avian diseases (true)	Monitoring of avian influenza viruses in Australian avifauna	Genotyping of Australian influenza viruses (ongoing)

Aquatic animal diseases (true)	Cross-species (amphibians and finfish) pathogenicity trials with BIV, MHRV and EHNV	Validate and innovate diagnostic methods, determine phylogenetic relationships of ranaviruses and identify susceptible species and potential reservoirs of infection.
Diagnosis, biotechnology and laboratory (true)	Bioassay & reagent research & development	Protein and antibody development, production and purification for LSDV, FDMV, BTV, ASF, IBDV, Henipavirus and ongoing molecular assay development
Vaccines (true)	MagVaX a universal liposomal vaccine delivery system	Generate a prototype for the MagVAX platform combining antibody and T-cell-stimulating antigens. Compare cellular responses in non-animal models following vaccination with MagVax. Compare in vivo immunogenicity and challenge study for the most promising optimized vaccine constructs.
Disease Control (true)	Comparative evaluation of three ELISAs for detection of antibodies to LSDV in Australian cattle and buffalo	To enhance serodiagnostic capability and preparedness for lumpy skin disease, in-house and commercial antibody detection ELISA kits will be evaluated and compared for their fitness for surveillance and proof of freedom testing purposes in cattle and buffalo.
Epidemiology, surveillance & risk assessment (true)	Bioinformatics of infectious animal disease	Improve the surveillance of viral threats at the border through the assessment of the use of mNGS as an unbiased viral surveillance tool
Zoonoses (true)	Vaccine immunology – developing tools to assess post vaccination responses – Hendra virus vaccine in horses	Developing/optimising a Luminex microsphere immune assay (LMIA) as a substitute for VNT, to assess the humoral immune response to HeV vaccine. Informing HeV vaccine schedule based on immune response kinetics.
Zoonoses (true)	Pathogenesis and transmission of genotype 4 Japanese encephalitis virus in the amplifier vertebrate host	Develop a model to characterise JEV GIV infection in pigs, evaluate efficacy and suitability of a commercial GIII-based vaccine for use in Australia, optimise methods for isolation of JEV GIV, determine how the emergence of GIV JEV impacts serological diagnosis of flavivirus infection, develop a model for JE reproductive disease in pregnant sows
Zoonoses (true)	Host-directed therapeutics for pandemic preparedness	Develop pan- or inter-family therapeutics by targeting host factors common to virus families of pandemic concern. Create a 'stockpile' of ready-to-use drugs when a pandemic emerges
Diagnosis, biotechnology and laboratory (true)	Study of lumpy skin disease virus (LSDV) pathogenesis and host immune response using newly developed ex-vivo models	Develop a bovine skin ex-vivo model, characterise LSDV pathogenesis and host response, describe pathogenesis and local host immune response of LSDV in different breeds/species.
Vaccines (true)	Antigenic evolution of AIV	Examine antigenic drift of Australian lineage H7 AIV, antigenically and functionally characterise antigenically advanced viruses, and develop next generation broadly reactive VLP vaccine.
Vaccines (true)	DISC vaccine platform development for African swine fever	Develop a next generation vaccine that will lead to host cell infection (one round) and expression of viral proteins required for robust immunity
Aquatic Animal Diseases (true)	Optimising immune resilience through energetic partitioning	To improve immune resilience in fish by ensuring sufficient energy is provided to mount a strong immune response. Understand the energetic costs

and requirements of immune responses. Develop PGE techniques for modulating immune pathways.

TOR3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable area
Improved laboratory quality assurance systems	Provide advice and support to laboratories wanting to establish or improve laboratory quality assurance systems such as those provided through ISO 17025:2017 General requirements for the competence of testing and calibration laboratories, ISO9001:2015, ISO 17043:2023 Conformity assessment — General requirements for the competence of proficiency testing providers.	Laboratory expertise

3. In exercising your activities, have you identified any regulatory research needs* relevant for WOA?H?

No

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

Yes

Name of WOA?H CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
BSL4ZNet	Global/virtual	Americas Asia and Pasific Europe	BSL4ZNet is a network of government mandated organisations with national level responsibility for protecting animal health by working together to enhance knowledge, competency and capacity to meet current and future high containment needs, including for new and emerging diseases
OFFLU	Global/virtual	Africa Americas Asia and Pasific Europe MiddleEast	Coordination of the science underpinning the management and control of influenza in animals

TOR4 AND 5: NETWORKING AND COLLABORATION

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

Yes

Name of WOA?H CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Global African Swine Fever Disease	Global/virtual	Africa Americas Asia and Pasific	To establish and sustain global research partnerships that will generate scientific knowledge and tools to

Research Alliance		Europe MiddleEast	contribute to the successful prevention, control and where feasible eradication of ASF
Global Foot-and-Mouth Disease Research Alliance	Global/virtual	Africa Americas Asia and Pasific Europe MiddleEast	A coordinated global alliance of scientists producing evidence and innovation that enables the progressive control and eradication of FMD
EVAg	Global/virtual	Africa Americas Asia and Pasific Europe MiddleEast	A coordinated global network that mobilises expertise in virology to amplify, characterize, standardize, authenticate, distribute, track, collect viruses and derived products
STAR-IDAZ	Global/virtual	Africa Americas Asia and Pasific Europe MiddleEast	The overall objective of the network is to coordinate research at the international level to contribute to new and improved animal health strategies for at least 30 priority diseases/infectious/issues

TOR6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOA?H?

Yes

NAME OF EXPERT	KIND OF CONSULTANCY	SUBJECT
Dr Trevor Drew	Member	WOAH Scientific Commission for Animal Diseases
Prof Trevor Drew Dr David Williams	Invited Participant/Member	ASF Reference Laboratory Network Meetings WOA Standing Group of Experts for African Swine Fever
Dr David Williams	Invited Participant	WOAH Pacific partners meeting
Dr Frank Wong	Chair and Member to the WOA/FAO Network of Expertise on Animal Influenza (OFFLU) Executive Committee	OFFLU Strategy and Technical Activities on Avian Influenza WOAH/OFFLU contributions to the WHO Tool for Pandemic Risk Assessment (TIPRA) on zoonotic influenza viruses Review of WOA Terrestrial Code and Terrestrial Manual chapter on Avian Influenza (via DAFF Australia)
Dr Frank Wong	Member of the WOA Regional Expert Network for Avian Diseases in Asia & the Pacific	Disease Diagnostics, Disease Surveillance Updates, and Laboratory Expertise on Avian Diseases
Dr Frank Wong	WOAH Regional Workshop for Avian Disease Prevention and Control in Asia and the Pacific	Disease Diagnostics, Disease Surveillance Updates, and Laboratory Expertise on Avian Diseases

Dr Frank Wong	90th Annual General Session of the World Assembly of Delegates of WOA; Animal Health Forum on Avian Influenza - Session Panelist	Session Panellist for Animal Health Forum on Avian Influenza – Policy to Action
Dr Frank Wong	Contribution of expertise and surveillance data to the WHO Vaccine Composition Meeting (VCM) through the OFFLU VCM Technical Activity, February and September 2023	Zoonotic Influenza Surveillance
Dr Debbie Eagles	Technical advice	Coordinated feedback from all BTV reference laboratories on test validation template
Dr Kim Halpin	WHO Meeting	Roadmap for the development of medical counter measures for Nipah virus

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

No

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOA, to personnel from WOA Members?

Yes

a) Technical visit : 68

b) Seminars : 345

c) Hands-on training courses: 12

d) Internships (>1 month) : 0

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
A	Diagnostic methods for avian influenza	Indonesia	28
A	ASF diagnostic methods	Vietnam	10
C	Laboratory placement for ASF tissue culture training	Indonesia	2
C	Diagnostic methods for avian influenza	Indonesia	10
B	Pathology and case study review for LSD and JEV	Indonesia	4
A	NGS training on AI and ASF	Indonesia	6
A	ASF Diagnostics and point of care	Indonesia	24

B	Diagnostics for FMD, LSD	Papua New Guinea	41
B	ASF Point of care and LAMP technical training	Indonesia	100
B	ASF & FMD Simulation exercise	Several Pacific Islands	200

TOR8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOAHP?

No

TOR9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOAHP that may be useful to Members of WOAHP

a) Articles published in peer-reviewed journals:

11

Edwards KM, Siegers JY, Wei X, Aziz A, Deng Y, Yann S, et. al. 2023. Detection of Clade 2.3.4.4b Avian Influenza A(H5N8) Virus in Cambodia 2021. *Emerg. Infect. Dis.* 2023;29(1):170-174. <https://doi.org/10.3201/eid2901.220934>

Karawita A.C., Cheng Y.Y., Chew K.Y., Challagulla A., Kraus R., et. al. 2023. The swan genome and transcriptome, it is not all black and white. *Genome Biol.* 24: 13. <https://doi.org/10.1186/s13059-022-02838-0>

Layton R., Layton D., Stanger K., Beggs D., Fisher A., Mansell P. 2023. The impact of stress and anaesthesia on animal models of infectious disease. *Frontiers Vet. Sci.* 10:3389 <https://doi.org/10.3389/fvets.2023.1086003>

Luczo J.M., Soumana I.H., Reagin K.L., Dihle P., Ghedin E., Klonowski K.D., Harvill E.T., Tompkins S.M. 2023. Bordetella bronchiseptica-Mediated Interference Prevents Influenza A Virus Replication in the Murine Nasal Cavity. *Microbiol. Spectrum.* 11: e04735-22. <https://doi.org/10.1128/spectrum.04735-22>

Reid T., Singanallur Balasubramani N., C. Waugh C., Bowden T., Newberry K., Colling A. Validation of diagnostic tests for infectious diseases: challenges and opportunities. In: *Proceedings of the International Symposium on Sustainable Animal Production and Health: Current Status and the Way Forward.* Vienna, 28 June - 2 July 2021. FAO, Rome. <https://doi.org/10.4060/cc2530en>

Tribolet L., Brice A.M., Fulford T.S., Layton D.S., Godfrey D.I., Bean A.G.D., Stewart C.R. 2023. Identification of a novel role for the immunomodulator ILRUN in the development of several T cell subsets in mice. *Immunol.* 228(3). doi.org/10.1016/j.imbio.2023.152380

Caruso S, Edwards SJ. Recently Emerged Novel Henipa-like Viruses: Shining a Spotlight on the Shrew. *Viruses.* 2023 15(12):2407. [doi: 10.3390/v15122407](https://doi.org/10.3390/v15122407).

Edwards SJ, Rowe B, Reid T, Tachedjian M, Caruso S, Blasdell K, Watanabe S, Bergfeld J, Marsh GA. Henipavirus-induced neuropathogenesis in mice. *Virology.* 2023 587:109856. [doi: 10.1016/j.virol.2023.109856](https://doi.org/10.1016/j.virol.2023.109856).

Pollak NM, Olsson M, Marsh GA, Macdonald J, McMillan D. Evaluation of three rapid low-resource molecular tests for Nipah virus. *Front Microbiol.* 2023 13:1101914. [doi: 10.3389/fmicb.2022.1101914](https://doi.org/10.3389/fmicb.2022.1101914).

Pollak NM, Marsh GA, Olsson M, McMillan D, Macdonald J. Rapid, sensitive, and specific, low-resource molecular detection of Hendra virus. *One Health.* 2023 16:100504. [doi: 10.1016/j.onehlt.2023.100504](https://doi.org/10.1016/j.onehlt.2023.100504).

Watanabe S, Yoshikawa T, Kaku Y, Kurosu T, Fukushi S, Sugimoto S, Nishisaka Y, Fuji H, Marsh G, Maeda K, Ebihara H, Morikawa S, Shimajima M, Saijo M. Construction of a recombinant vaccine expressing Nipah virus glycoprotein using the replicative and highly attenuated vaccinia virus strain LC16m8. *PLoS Negl Trop Dis.* 2023. 17(12):e0011851. [doi: 10.1371/journal.pntd.0011851](https://doi.org/10.1371/journal.pntd.0011851).

b) International conferences:

12

Williams, David. Effect of High Temperature Exposure and Laboratory Processing Techniques on the Diagnostic Performance of Dry Swabs for the Detection of ASFV. GARA Gap Analysis Workshop, Manila, Philippines, December 5-7, 2023. Oral presentation.

Davis, Samantha. *New Insights into Transcriptional Dysregulation Following Infection of Domestic Pigs with Moderately Virulent African Swine Fever Virus*. GARA Gap Analysis Workshop, Manila, Philippines, December 5-7, 2023. Oral presentation.

O'Dwyer, James. *Emergence of microvariants of ASFV Genotype II in the Asia-Pacific*. GARA Gap Analysis Workshop, Manila, Philippines, December 5-7, 2023. Poster presentation.

Williams, David. *Comparative evaluation of qPCR diagnostic tests for the detection of African swine fever virus DNA in oral swabs, swine oral fluids and whole blood*. GARA Gap Analysis Workshop, Manila, Philippines, December 5-7, 2023. Poster presentation.

Williams, David. *The role of oral fluids and faeces for the laboratory diagnosis of African swine fever*. Conference on ASF in Vietnam: A Comprehensive Approach to Disease Prevention and Management. Ho Chi Minh City, Vietnam, 12th May, 2023. Online presentation.

Williams, David. *ASF Diagnostic Tools*. ASEAN ASF Workshop. 2-4 May 2023. Quezon City, The Philippines. Online presentation.

Williams, David. *Point-of-Care Rapid Testing in the Field*. FAO Global Consultations

Grimsey J, Cooke J, Gagliardi M., Grech E., Wong F., Butler J. Giles M. *Optimisation of antiserum production to highly pathogenic avian influenza viruses at ACDP*. 15th Australian Influenza Symposium. 2-3 November 2023, WHO Collaborating Centre for Reference and Research on Influenza, VIDRL. Melbourne.

Wong F. *Surveillance of LPAI for risk mitigation and incursion and prevention*. WOAHA Regional Representation for Asia and the Pacific, 29-31 August 2023. Qingdao, People's Republic of China.

Wong F. *Strategic Challenges 1 Panellist: Avian influenza intelligence - Surveillance and monitoring for early detection*. Animal Health Forum on Avian Influenza, Policy to Action. 90th Annual General Session of the World Assembly of Delegates of the World Organisation for Animal Health (WOAH), 21-25 May 2023, Paris.

Validation of diagnostic tests for infectious diseases: challenges and opportunities. International Symposium on Sustainable Animal Production and Health: Current Status and the Way Forward. T. Reid; N. Singanallur Balasubramani; C. Waugh; T. Bowden; K. Newberry; A. Colling. 2023. Conference Paper

c) National conferences:

4

Williams, David, Wright, Quentin, Islam, Tanjir, Davis, Samantha. *Towards development of a next generation vaccine for African swine fever virus*. Australian Pig Veterinarians' Conference, Sunshine Coast, 16-19 July 2023. Pre-recorded presentation.

Jia, Fan. *DISC - The Next Generation of African swine fever vaccine*. Victorian Infectious & Immunity Network Young Investigator Symposium. Melbourne, 9th November 2023. Poster.

Wong F. *Avian Influenza Update*. Ideas Exchange Program, 17-18 October 2023. Poultry Hub Australia, University of New England, Armidale, Australia.

Wong F. *Global HPAI Update*. Recent Advances in Emergency Animal Diseases Annual Symposium, 11-12 October 2023. CSIRO Australian Centre for Disease Preparedness, Geelong, Australia.

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

14

Australian Centre for Disease Preparedness African swine fever website: <https://www.csiro.au/en/research/animals/veterinary/African-swine-fever>

ACDP media release: <https://www.csiro.au/en/news/All/Articles/2023/November/African-swine-fever-vaccine>

Wong F. *Contributions to the OFFLU Steering & Executive Committee Meetings*. Current Chairperson of the OFFLU Executive Committee and OFFLU Avian Influenza Technical Group. <https://www.offlu.org/>

Wong F. *OFFLU contributions to the WHO Vaccine Composition Meeting consultations on zoonotic influenza, Feb and Sep 2023*. <https://www.offlu.org/index.php/publications/>

Wong F. *Contributions to FAO Regional Consultation on Environmental Surveillance for Zoonotic Influenza in Asia*, 14-16 November 2023. FAO-RAP, Bangkok.

Wong F. *Contributions to the FAO Global Consultation on HPAI*. Hybrid Meeting, 2-4 May 2023. FAO Rome. <https://www.fao.org/documents/card/en?details=cc7302en>

Wong F. *World Health Organization TIPRA Expert Consultation on H5N1 Clade 2.3.4.4b*. 11 May 2023, WHO, Geneva.

Wong F. *Contributions to the 2nd Workshop of the WOAHA Avian Diseases Network in East Asia*, 8 June 2023 (Virtual). WOAHA-RRAP, Tokyo.

Colling A., Day A. *ACDP contribution to update of WOAHA Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, twelfth edition 2023*. Chapter 1.1.5. Quality Management in Veterinary Testing Laboratories. <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-manual-online-access/>

Newberry K., Colling A., *ACDP contribution to update of WOAHA Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, twelfth edition 2023*. Chapter 2.2.4.

Measurement Uncertainty. <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-manual-online-access/>

Newberry K., Colling A. ACDP contribution to WOAHA Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, twelfth edition 2023. Chapter 1.1.9. Tests for sterility and freedom from contamination of biological materials intended for veterinary use. <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-manual-online-access/>

Reising M., Colling, A. ACDP contribution to update of WOAHA Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, twelfth edition 2023. Chapter 2.2.8. Comparability of assays after changes in a validated test method. <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-manual-online-access/>

Waugh C., Cabuang L. ACDP contribution to update of WOAHA Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, twelfth edition 2023. Chapter 2.2.6. Use of reference samples and panels. <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-manual-online-access/>

National Animal Health Monitoring Program Annual Report, available at <https://animalhealthaustralia.com.au/>

11. What have you done in the past year to advance your area of focus, e.g. updated technology?

Significant changes in the application of whole genome sequencing to outbreak response.

Significant investment in early career researchers (postdoctoral and PhDs) including in research of new and emerging diseases.

12. Additional comments regarding your report: