World Organisation for Animal Health

Kim Halpin - - AUSTRALIA

WOAH Reference Laboratory Reports Activities 2025

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Hendra and Nipah virus diseases
***Address of laboratory:**	5 Portarlington Road, East Geelong, Victoria, 3219 Australia
***Tel:**	+61-3 52 27 50 00
***E-mail address:**	kim.halpin@csiro.au
Website:	https://www.csiro.au/en/about/facilities-collections/acdp
***Name (including Title) of Head of Laboratory (Responsible Official):**	Dr Debbie Eagles, Director, Australian Centre for Disease Preparedness
***Name (including Title and Position) of WOAH Reference Expert:**	Dr Kim Halpin, Pathology and Pathogenesis Group Leader, Australian Centre for Disease Preparedness
***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
Hendra cELISA	Yes	150	1
Hendra DIVA ELISA	No	49	0
Nipah iELISA	Yes	58	0
Hendra SNT	Yes	381	1
Nipah SNT	Yes	7	0
Direct diagnostic tests		Nationally	Internationally
Hendra Virus Real-time PCR	Yes	713	1
Nipah Virus Real-time PCR	Yes	5	0
Next generation sequencing	No	1	0
virus isolation	Yes	18	0

TOR2: REFERENCE MATERIAL

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOAH?

No

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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
Nipah virus (live)	PCR and other diagnostic assay development	produced and provided	0	2 ML	3	CZECH REPUBLIC, FRANCE, HUNGARY,
Hendra virus (live)	PCR and other diagnostic assay development	produced and provided	0	0.5 ML	1	CZECH REPUBLIC,
Hendra vaccinated horse serum	Diagnostic assay validation	produced and provided	0	3 ML	1	UNITED STATES OF AMERICA,
Hendra ELISA Network Quality Control	ELISA	produced and provided	1 ML	0	1	AUSTRALIA,
Hendra PCR Network Quality Control	PCR	produced and provided	5 ML	0	1	AUSTRALIA,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

Yes

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
Hendra DIVA ELISA	ELISA for the detection of antibodies to Hendra virus, differentiating infected horses from vaccinated horses McNabb L, McMahon A, Woube EG, Agnihotri K, Colling A, Broder CC, Kucinskaite-Kodze I, Petraityte-Burneikiene R, Bowden TR, Halpin K. Development and Validation of a Differentiating Infected from Vaccinated Animals (DIVA) Enzyme-Linked Immunosorbent Assay (ELISA) Strategy for Distinguishing Between Hendra-Infected and Vaccinated Horses. Viruses. 2025 Feb 28;17(3):354.

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

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

TOR4: DIAGNOSTIC TESTING FACILITIES

10. Did your laboratory carry out diagnostic testing for other WOAH Members?

No

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

No

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAH Members other than the own?

No

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?

No

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

No

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:

8

Barr J, Caruso S, Edwards SJ, Todd S, Smith I, Tachedjian M, Crameri G, Wang LF, Marsh GA. Novel Henipavirus, Salt Gully Virus, Isolated from Pteropid Bats, Australia. Emerg Infect Dis. 2025 Sep;31(9):1824-1828. doi: 10.3201/eid3109.250470. PMID: 40867060; PMCID: PMC12407197.

Isaacs A, Nieto GV, Zhang X, Modhiran N, Barr J, Thakur N, Low YS, Parry RH, Barnes JB, Jara R, Himelreichs J, Yao Y, Deride C, Barthou-Gatica B, Salinas-Rebolledo C, Ehrenfeld P, Hen JJ, Hayes N, Paramitha D, Morgan MS, McMillan CLD, Jones ML, Munro TP, Khromykh AA, Reading PC, Young PR, Chappell KJ, Shi Y, Bailey D, Marsh GA, Chiu S, Rojas-Fernandez A, Watterson D. A nanobody-based therapeutic targeting Nipah virus limits viral escape. Nat Struct Mol Biol. 2025 Oct;32(10):1920-1931. doi: 10.1038/s41594-025-01598-2. Epub 2025 Jul 8. PMID: 40629166.

McLean RK, Pedrera M, Thakur N, Elrefaey AME, Hodgson S, Lowther S, Reid T, Todd S, Rowe B, Bergfeld J, Trinidad L, Riddell S, Edwards S, Payne J, Barr J, Rye N, Bruce M, Poole T, Brown S, Dalziel T, Au G, Fisher M, Layton R, Lambe T, Chappell K, Isaacs A, Watterson D, Mourino M, Raue R, Shanta IS, Siddika A, Begum MN, Rahman S, Bhuyan AAM, Alam M, Rahman MZ, Rahman M, Tchilian E, Gilbert SC, Young P, Bailey D, Marsh GA, Graham SP. Nipah virus vaccines evaluated in pigs as a 'One Health' approach to protect public health. NPJ Vaccines. 2025 Jul 23;10(1):163. doi: 10.1038/s41541-025-01212-y.

McNabb L, McMahon A, Woube EG, Agnihotri K, Colling A, Broder CC, Kucinskaite-Kodze I, Petraityte-Burneikiene R, Bowden TR, Halpin K. Development and Validation of a Differentiating Infected from Vaccinated Animals (DIVA) Enzyme-Linked Immunosorbent Assay (ELISA) Strategy for Distinguishing Between Hendra-Infected and Vaccinated Horses. Viruses. 2025 Feb 28;17(3):354.

Moore KA, Mehr AJ, Ostrowsky JT, Ulrich AK, Moua NM, Fay PC, Hart PJ, Golding JP, Benassi V, Preziosi MP, Broder CC, de Wit E, Formenty PBH, Freiberg AN, Gurley ES, Halpin K, Luby SP, Mazzola LT, Montgomery JM, Spiropoulou CF, Mourya DT, Parveen S, Rahman M, Roth C, Wang LF, Osterholm MT. Measures to prevent and treat Nipah virus disease: research priorities for 2024-29. Lancet Infect Dis. 2024 Nov;24 (11):e707-e717.

Pigeaud DD, Fenton KA, Turcinovic J, Borisevich V, Agans KN, Deer DJ, Harrison MB, Fears AC, Dobias NS, Prasad AN, Smith IL, Williams DT, Woolsey CB, Broder CC, Cross RW, Geisbert TW. Experimental challenge of African green monkeys with contemporary Hendra virus isolates produces divergent clinical disease. Emerg Microbes Infect. 2025 Dec;14(1):2544735.

Tripp MN, Rawlinson SM, Edwards SJ, Luczo JM, Marsh GA, Halpin K, Moseley GW. The intracellular virus-host interface of henipaviruses. J Virol. 2025 Jul 18:e0077025. doi: 10.1128/jvi.00770-25.

Zhao T, Gomez FA, David CT, Rootes CL, Stewart CR, Moseley GW, Rawlinson SM. Sub-Nucleolar Trafficking of Hendra Virus Matrix Protein Is Regulated by Ubiquitination. Viruses. 2025 May 30;17(6):797. doi: 10.3390/v17060797. PMID: 40573390; PMCID: PMC12197414.

b) International conferences:

1

Tripp MN, Edwards SJ, David C, Rawlinson SM, Halpin K, Marsh GA, Moseley GW. Emerging strains of Hendra virus differing in immune evasion and replication. 19th Negative Strand RNA Virus International Meeting, Montpellier, France. June 22-27, 2025

c) National conferences:

2

Dowling E, Edwards S, Sundaramoorthy V, Mackenzie M, Marsh G. Cedar virus and Salt Gully virus are capable of viral mRNA editing during henipavirus infection. Victorian Infection and Immunity Network Young Investigator Symposium. Melbourne, Australia. November 14, 2025

Halpin K. Discovered thirty-one years ago – what we know about Hendra virus. Recent Advances in Emergency Animal Diseases Symposium, Geelong, Australia. November 12, 2025

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

0

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 : 3

b) Seminars : 0

c) Hands-on training courses: 0

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
A	PHILIPPINES	3

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
Integrated Management System (IMS) covering: ISO:9001 ISO:17025 ISO:17043	BSI ISO9001 FS 605099-001 NOV 2028.pdf NATA ISO 17025 APR 2024.pdf NATA ISO 17043 NOV 2022	BSI ISO9001 QMS 605099 - 001.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Hendra and Nipah PCRs and ELISAs and SNTs	BSI and NATA

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

Yes

The laboratory has a dedicated Biorisk Management Group who provide specialist advice, monitor and improve Biosafety, Biosecurity and Biocontainment activities and perform annual testing and validation on Biocontainment systems. The team uses a biorisk management approach aligned with ISO 35001 to implement a system of managing biosafety and biosecurity across a wide array of biological hazards. The Biorisk Management Group develop and implement standard operating procedures and institutional policies that set the framework for the handling of biological materials across ACDP and provide ultimate assurance that the laboratory activities pose negligible danger to Australia’s agriculture or public health. Policies and procedures are contained in the annually reviewed ACDP Biorisk Manual consisting of various sections as follows. • Section 1 Administration • Section 2 PC2 Procedures and Policies • Section 3 PC3 Procedures and Policies • Section 4 PC4 Procedures and Policies • Section 5 Large Animal Facility (LAF) Procedures and Policies • Section 6 Personnel and Procedural Controls • Section 7 Transport and Storage of Biological Material • Section 8 Movement of Material, Equipment and Waste • Section 9 Engineering Procedures and Polices • Section 10 Microbiological Incident Response Procedures and Policies The ACDP biological risk management system has clear and unequivocal commitment by laboratory management, who ensure that roles, responsibilities, resources and authorities related to biological risk management are defined, documented, and communicated to those who manage, perform, and verify work associated with biological agents and toxins in the laboratory. The Biorisk Management Team are audited over 3 days every 6 months by an external security assessment team to provide an independent review of elements affecting ACDP’s microbiological and physical security operations and to advise CSIRO senior executive management of any areas of concern or risk. Biosafety and biosecurity operations are also audited frequently by Australia’s regulatory agencies, the Department of Agriculture, Fisheries and Forestry (DAFF), the Office of the Gene Technology Regulator (OGTR) and the Security Sensitive Biological Agents Regulatory Scheme (SSBA).

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?

No

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease?

Not applicable (only WOAH Reference Laboratory designated for the disease

24. Are you a member of a network of WOAH Reference Laboratories designated for the same pathogen?

Not applicable (only WOAH Reference Laboratory designated for the disease

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen during the past 2 years?

Not applicable (Only WOAH Reference Laboratory designated for the disease)

not applicable

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?

Not applicable (only WOAH Reference Laboratory designated for the disease

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 during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
Molecular PCR detection of Hendra as part of the Laboratories Emergency Animal Disease Diagnosis and Response (LEADDR) Network	Organizer and Participant	9	Hendra virus Real-time PCR	AUSTRALIA,
Detection of Hendra antibodies using an ELISA commercial kit as part of the Laboratories Emergency Animal Disease Diagnosis and Response (LEADDR) Network	Organizer and Participant	5	Hendra virus iELISA	AUSTRALIA,

TOR12: EXPERT CONSULTANTS

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

Yes

Kind of consultancy	Location	Subject (facultative)
Dr Jemma Bergfeld - Invited presenter	Kagoshima, Japan	Asia-Pacific Wildlife Health workshop
Dr Jemma Bergfeld - invited participant	online	WOAH Collaborating Centre Network for Wildlife Health (WildNet) Annual Meeting
Dr Dwane O'Brien - invited participant	Paris	WOAH General Assembly
Dr Debbie Eagles - Invited speaker and panellist	Geneva	WOAH Global Conference of Biological Threat Reduction

29. Additional comments regarding your report:

Yes

The Reference Expert has participated in numerous WHO meetings, specifically around establishing the Paramyxovirus collaborative open research consortium (CORC). The goal of WHO's pathogen Family strategy is for equitable R&D approaches at national, regional and global levels. Involving Hendra virus and Nipah virus (both Paramyxoviruses) WOAH reference experts in the CORC is critical for a One Health approach.