World Organisation for Animal Health

Kyle Garver - - CANADA

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:**	Viral haemorrhagic septicaemia
***Address of laboratory:**	Pacific Biological Station, 3190 Hammond Bay Road, Nanaimo, British Columbia, Canada, V9T 6N7
***Tel:**	+1-250 756 73 40
***E-mail address:**	Kyle.Garver@dfo-mpo.gc.ca
Website:	https://profils-profiles.science.gc.ca/en/profile/kyle-garver
***Name (including Title) of Head of Laboratory (Responsible Official):**	Andrew Thomson (Regional Director of Science)
***Name (including Title and Position) of WOAH Reference Expert:**	Dr. Kyle Garver, Research Scientist
***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
	No	0	0
Direct diagnostic tests		Nationally	Internationally
RT-qPCR	Yes	851	66
RT-PCR	Yes	11	0
Virus Isolation	Yes	1064	0

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
Liquid extraction controls - Artificial RNA transcript containing the primer and probe	RT-qPCR (Garver et al. 2011)	Produced	1 Aliquots (0.25 ml)	0	1	CANADA,

binding sites spiked in EPC cell suspension						
Tissue Extraction - Naive kidney tissue spiked with artificial RNA transcript containing primer and probe binding sites	RT-qPCR (Garver et al. 2011)	Produced	105 Aliquots (7875 ml)	0	1	CANADA,
RT controls - Artificial RNA transcript	RT-qPCR (Garver et al. 2011)	Produced	77 Aliquots (924 ml)	0	1	CANADA,
qPCR controls - cDNA generated from artificial RNA transcript	RT-qPCR (Garver et al. 2011)	Produced	210 Aliquots (2520 ml)	0	1	CANADA,
Cell Lines	Cell Culture	Provided	2 Flasks	0	1	CANADA,
IHNV RNA	Cell Culture and RT-qPCR	Provided	0	2 aliquots (0.5 ml)	1	CHILE,

4. Did your laboratory produce vaccines?

Not applicable

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?

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?

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?

Yes

Name of the WOAH Member Country receiving a technical consultancy	Purpose	How the advice was provided
UNITED STATES OF AMERICA	Surveillance approaches	remote
UNITED STATES OF AMERICA	VHSV in Pacific Salmon	remote
CANADA	Tissue tropism	remote
CANADA	Pacific Hake susceptibility	remote
CHILE	RT-qPCR control material	remote

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
Test method development and validation	2025-2027	Optimize diagnostic test methods	EURL for fish and crustacean diseases and Australian Centre for Disease Preparedness | CSIRO ACDP Fish Diseases Laboratory	AUSTRALIA DENMARK
Epidemiology of VHSV genotype	2022-2026	Genetic diversity and distribution	Western Fisheries Research	UNITED STATES OF AMERICA

IV		of VHSV genotype IV	Center	
Immune response to VHSV	2025-2026	Determine temperature effect on VHSV immune response	University of Waterloo	CANADA

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:
Survey of wild and farmed fish populations for VHSV

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:
VHSV prevalence and genotype circulating within wild and cultured fish populations

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:

2

b) International conferences:

1

c) National conferences:

2

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 : 0

c) Hands-on training courses: 1

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

C	CANADA	1

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO/IEC 17025-2017	pdf	ASB_SOA_151008_FY23_v1_2023-07-31.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Reverse Transcription Quantitative PCR for Detection of Infectious Hematopoietic Necrosis Virus (IHNV)	Standards Council of Canada
Isolation of Viral Agents (IPNV, IHNV, EHNV, SVCV, ISAV, SAV, & VHSV) from Finfish by Cell Culture	Standards Council of Canada
Reverse Transcription Quantitative PCR for Detection of Viral Hemorrhagic Septicemia Virus (VHSV)	Standards Council of Canada
Reverse transcription quantitative PCR assay for detection of infectious pancreatic necrosis virus (IPNV)	Standards Council of Canada
RT-qPCR Test Method Protocol using TaqMan Universal PCR Master Mix for the Detection of Infectious Salmon Anemia Virus	Standards Council of Canada
Histological Detection and Identification of Bivalve Mollusc Pathogens	Standards Council of Canada

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

Yes

Maintain laboratory compliance level 2 for in vitro facilities in accordance with the Canadian Standard and the Containment Standards for Facilities Handling Aquatic Animals Pathogens

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?

Yes

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

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
Annual VHSV Ref Lab check-in	co-organizer	3	Korea, Denmark and Canada

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?

Yes

Purpose of the proficiency test:	Role of your Reference Laboratory (organiser/ participant)	No. participating Laboratories	Participating WOAH Ref. Labs/ organising WOAH Ref Lab
Interlaboratory proficiency test administered by EURL for Fish and Crustacean diseases	participant	45	Participating WOAH reference laboratory for VHSV in Korea, Canada, and Denmark. Organized by reference laboratory in Denmark.

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 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
Checking and certifying the performance of individual operators	organizer	3	RT-qPCR	
Assess competency for diagnosis of fish diseases including VHSV (Participate in the inter-laboratory PT from EU Reference Laboratory for fish and crustacean diseases)	participant	45	Cell culture virus isolation and RT-qPCR	

TOR12: EXPERT CONSULTANTS

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

Yes

Kind of consultancy	Location	Subject (facultative)
Review of WOAH Aquatic Manual	remote	Test method and pathogen biology
Responding to technical and training queries	remote	Diagnostic applications
Review of WOAH Standards	remote	Aquatic Animal Health
Participation in WOAH Surveys	remote	Aquatic Animal Health
Assist in the development of a WOAH phone app	remote	Pathogen biology

29. Additional comments regarding your report: