

OIE Reference Laboratory Reports Activities

Activities in 2021

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Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Viral haemorrhagic septicaemia
Address of laboratory:	Pathology Research Division in Aquaculture Research Department National Institute of Fisheries Science (NIFS) Ministry of Oceans and Fisheries 216 Gijanghaean-ro Gijang-eup Busan, 46082 KOREA (REP. OF)
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Name (including Title) of Head of Laboratory (Responsible Official):	Dong-Sik Woo
Name (including Title and Position) of OIE Reference Expert:	Hyoung Jun Kim
Which of the following defines your laboratory? Check all that apply:	Governmental

ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards

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 OIE Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests		Nationally	Internationally
-	-	-	-
Direct diagnostic tests		Nationally	Internationally
Cell cultivation of EPC cells for VHS	Yes	18	
Conventional RT-PCR for VHS	Yes	18	
Real time RT-PCR for VHS	Yes	18	

**ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards.
To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.**

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

No

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient OIE Member Countries	Region of recipients
DIV-1 PCR positive control DNA	PCR for DIV-1 gene detection	Yes	1 mL	0.6 mL	3	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to OIE Member Countries?

No

ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?

Yes

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?

No

Name of the new test or diagnostic method or vaccine developed	Description and References (Publication, website, etc.)
Conventional RT-PCR method for VHSV gene detection using the new 3F2R primer set(update on OIE diagnostic manual for VHS)	<p>1. Validation of a novel one-step reverse transcription PCR method for detecting viral haemorrhagic septicaemia virus (Aquaculture 492, 170-183) 2. Importance of the 3'-terminal nucleotide of the forward primer for nucleoprotein gene detection of viral hemorrhagic septicemia virus by conventional reverse-transcription PCR (Indian Journal of Microbiology 59(2):234-236) 3. OIE Manual of Diagnostic Tests for Aquatic Animals 2021 (https://www.oie.int/fileadmin/Home/eng/Health_standards/aahm/current/2.3.10_VHS.pdf)</p>

ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

No

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

Yes

Name of the OIE Member Country receiving a technical consultancy	Purpose	How the advice was provided
PERU	Request of PCR positive control for DIV-1 gene detection	The PCR positive control DNA was provided by our OIE reference laboratory.
VIETNAM	Request of PCR positive control for DIV-1 gene detection	The PCR positive control DNA was provided by our OIE reference laboratory.
BANGLADESH	Request of PCR positive control for DIV-1 gene detection	The PCR positive control DNA was provided by our OIE reference laboratory.

ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	OIE Member Countries involved other than your country
Cooperation researches by MOA between Korea and Denmark	2017-2022	1. Development of Diagnostic methods 2. Cooperation Research about characterization of chimeric VHSV 3. Infection trial using infectious virus	Prof. Niels Jorgen Olesen (DTU Aqua, OIE reference laboratory for VHS)	DENMARK
Cooperation researches by MOU between Korea and Japan	2018-2022	Characterization about Novel fish cell line	Dr. Kei Yuasa (National Research Institute of Aquaculture)	JAPAN
Pathogenicity of two lineages of IHNV in Korea	2021-2022	Pathogenicity of two lineages of IHNV in Korea	Dr. Ole Bendik Dale (OIE Reference Laboratory for ISA, Norwegian Veterinary Institute)	NORWAY

ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases

11. Did your Laboratory collect epizootiological data relevant to international disease control?

No

If the answer is no, please provide a brief explanation of the situation:

In 2021, our OIE reference laboratory could not detect VHSV from fish samples. And our laboratory spent so many times for re-construction of OIE reference laboratory in NIFS.

12. Did your laboratory disseminate epizootiological data that had been processed and analysed?

No

If the answer is no, please provide a brief explanation of the situation:

In 2021, our OIE reference laboratory could not detect VHSV from fish samples. And our laboratory spent so many times for re-construction of OIE reference laboratory in NIFS.

13. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category)

a) Articles published in peer-reviewed journals: 4

1. Molecular cloning and characterization of chemokine C-C motif ligand 34 (CCL34) genes from olive flounder

(Paralichthys olivaceus). 2021. Jin-Young Kim, Jeong Su Park, Tae Sung Jung, Hyoung Jun Kim, Se Ryun Kwon. Fish & Shellfish Immunology. <https://doi.org/10.1016/j.fsi.2021.06.012>.

2. Poly (I:C)-Potentiated Vaccination Enhances T Cell Response in Olive Flounder (Paralichthys olivaceus) Providing Protection against Viral Hemorrhagic Septicemia Virus (VHSV). 2021. Jin Hong Chun, Jae Wook Jung, Young Rim Kim, Jassy Mary S. Lazarte, Si Won Kim, Jae sung Kim, Kim D. Thompson, Hyoung Jun Kim, Tae Sung Jung. Vaccines. <https://doi.org/10.3390/vaccines9050482>.

3. Development and validation of a lateral flow immunochromatographic assay for specific detection of viral hemorrhagic septicemia virus (VHSV, genotype IVa) in olive flounder (Paralichthys olivaceus). 2021. Kyoung-Hui Kong, Ha-Na Jeong, K. U. Shyam, Myung-Joo Oh, Choon-Sup Kim, Hyoung Jun Kim, Wi-Sik Kim. Aquaculture. <https://doi.org/10.1016/j.aquaculture.2021.736491>.

4. Immune gene expression and protection effect against VHSV by injection of interferon regulatory factor 10 in zebrafish (Danio rerio). 2021. Hye Ji Kim, Jin Young Kim, Jong Bin Park, Ji Hyun Lee, Jeong Su Park, Hyoung Jun Kim, Se Ryun Kwon. Journal of Fish Pathology. <https://doi.org/10.7847/jfp.2021.34.1.023>

b) International conferences: 3

1. SUSCEPTIBILITY OF VIRAL HAEMORRHAGIC SEPTICAEMIA VIRUS (VHSV) GENOTYPES I, II, III, IVA AND IVB IN OLIVE FLOUNDER (PARALICHTHYS OLIVACEUS), RAINBOW TROUT (ONCORHYNCHUS MYKISS) AND ZEBRAFISH (DANIO RERIO). 2021. Hyoung Jun Kim, Niels Jørgen Olesen, Min Sun Kim. EAFP international conference

2. Standardization of validation method for real-time PCR to detect target gene from infectious agents based on VHS OIE standard method. 2021. Young-Chul Kim, Min Ji Kim, Hye-Sung Choi, Niels Jørgen Olesen, Hyoung Jun Kim. KOFFST international conference 2021

3. Notification about revision of the one-step conventional RT-PCR method for diagnosis of viral haemorrhagic septicaemia (VHS) in OIE diagnostic manual. 2021. Hyoung Jun Kim, Niels Jørgen Olesen. International Conference on the future technology of fisheries science.

c) National conferences: 0

d) Other:

(Provide website address or link to appropriate information) 0

ToR 7: To provide scientific and technical training for personnel from OIE Member Countries

To recommend the prescribed and alternative tests or vaccines as OIE Standards

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

Yes

a) Technical visits: 15

b) Seminars: 1

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
a,b	Sri Lanka	2
a,b	Indonesia	2
a,b	Ghana	2
a,b	Philippines	1
a,b	Peru	1
a,b	East Timor	2
a,b	Tanzania	2
a,b	Uganda	1
a,b	Cameroon	1
a,b	Laos	1

ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned

15. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)
ISO/IEC 17025:2017	Certificate of ISO17025.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Molecular techniques for Viral haemorrhagic septicaemia	KOLAS (Korea Laboratory Accreditation Scheme)
Molecular techniques for Koi herpesvirus disease	KOLAS (Korea Laboratory Accreditation Scheme)
Molecular techniques for Spring Viraemia of Carp	KOLAS (Korea Laboratory Accreditation Scheme)
Fish cell culture method	KOLAS (Korea Laboratory Accreditation Scheme)

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

No

(See *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4*)

ToR 9: To organise and participate in scientific meetings on behalf of the OIE

18. Did your laboratory organise scientific meetings on behalf of the OIE?

Yes

National/ International	Title of event	Co-organiser	Date (mm/yy)	Location	No. Participants
International	Exchange of Samonid diseases information	Dr. Young Jin Park from Nord University	06/21	NIFS	13

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
rd meeting of steering committee of Regional Collaboration on Aquatic Animal Health regional collaboration framework on AAH	12/21	On line	Speaker	OIE reference laboratory for VHS in Korea
20th Meeting of the Asia Regional Advisory Group on Aquatic Animal Health (AGM 20)	11/21	On line	Short communications	Expert of OIE reference laboratory for VHS
OIE General Assembly	05/21	On line	Deligate	
The 3rd OIE Regional Meeting for OIE Reference Centres in Asia and the Pacific	03/21	On line	Speaker	OIE reference laboratory for VHS in Korea

ToR 10: To establish and maintain a network with other OIE Reference Laboratories

designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results

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

Yes

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

Yes

Purpose of the proficiency tests: ¹	Role of your Reference Laboratory (organiser/participant)	No. participants	Participating OIE Ref. Labs/ organising OIE Ref. Lab.
Inter-laboratory proficiency test 2020 by EU reference laboratory for fish and crustacean diseases	participant	2	OIE reference laboratory for VHS in Korea/OIE reference laboratory for VHS in Denmark

¹ validation of a diagnostic protocol: specify the test; quality control of vaccines: specify the vaccine type, etc.

22. Did your laboratory collaborate with other OIE Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

Yes

Title of the project or contract	Scope	Name(s) of relevant OIE Reference Laboratories
Memorandum of agreement (MOA) between the national institute of aquatic resources (OIE reference laboratory for VHS in Denmark) and National Institute of Fisheries Science (NIFS, OIE reference laboratory for VHS in Korea) on cooperative research project for fish disease control	Enhance and strengthen the bilateral relationship through cooperative research and meetings of the Sides for the development and standardization of diagnostic tools; methods to prevent the spread of infectious agents; disease prevention systems etc., in accordance with basic regulations of the OIE aquatic animal health code	OIE reference laboratory for VHS in Korea(NIFS) and OIE reference laboratory for VHS in Denmark (DTU, National Institute of Aquatic Resources)

ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than

OIE Reference Laboratories for the same disease?

Yes

Note: See Interlaboratory test comparisons in: Laboratory Proficiency Testing at:
<http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing> see point 1.3

Purpose for inter-laboratory test comparisons ¹	No. participating laboratories	Region(s) of participating OIE Member Countries
To primarily assess the identification of the fish viruses: VHSV, IHNV, EHNV, SVCV, IPNV, Ranavirus by cell culture based methods and molecular methods	41	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input checked="" type="checkbox"/> Middle East
Assessing the ability of participating laboratories to identify the fish pathogens: ISAV, SAV and CyHV-3(KHV) by biomolecular methods (PCR, sequencing and genotyping)	38	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input checked="" type="checkbox"/> Middle East

ToR 12: To place expert consultants at the disposal of the OIE

24. Did your laboratory place expert consultants at the disposal of the OIE?

Yes

Kind of consultancy	Location	Subject (facultative)
3rd meeting of steering committee of Regional Collaboration on Aquatic Animal Health regional collaboration framework on AAH	On line	Meeting between OIE experts and OIE focal point
20th Meeting of the Asia Regional Advisory Group on Aquatic Animal Health (AGM 20)	On line	Meeting between Naca and OIE experts
OIE General Assembly	On line	Meeting between OIE and Delicate of all members countries
The 3rd OIE Regional Meeting for OIE Reference Centres in Asia and the Pacific	On line	Meeting between OIE and OIE reference centres in Asia and the Pacific

25. Additional comments regarding your report:

In 2021, the developed new conventional RT-PCR method by OIE twinning project between Korea and Denmark was adopted on the OIE manual of diagnostic tests for aquatic animals 2021(Chapter 2.3.10. Infection with Viral Haemorrhagic Septicaemia Virus).

Our OIE reference laboratory for VHS in Korea was moved to National Institute of Fisheries Science (NIFS) from National Fishery Products Quality Management Service (NFQS) in Korea.