

# OIE Reference Laboratory Reports Activities

## *Activities in 2020*

**This report has been submitted : 2021-01-29 02:47:34**

<b>Name of disease (or topic) for which you are a designated OIE Reference Laboratory:</b>	Viral haemorrhagic septicaemia
<b>Address of laboratory:</b>	Aquatic Animal Quarantine (AAQ) Laboratory General Service Division National Fishery Products Quality Management Service (NFQS) Ministry of Oceans and Fisheries 337 Haeyang-ro Yeongdo-gu Busan, 49111 KOREA (REP. OF)
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<b>Name (including Title) of Head of Laboratory (Responsible Official):</b>	Dong Yeob Yang
<b>Name (including Title and Position) of OIE Reference Expert:</b>	Hyoung Jun Kim
<b>Which of the following defines your laboratory? Check all that apply:</b>	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			
-	-	-	-
Direct diagnostic tests			
Cell cultivation of BF-2 for VHS quarantine	Yes		490
Cell cultivation of EPC for SVC monitoring	Yes	174	
Conventional RT-PCR for VHS	Yes		490
Conventional RT-PCR for SVC	Yes	174	
Real time RT-PCR for VHS	Yes	4	

**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 type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Fish cell lines (BF-2, RTG-2, FHM, EPC)	Virus propagation	Yes	20 X 5 ml	0	0	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
IHN virus	Co-research	Yes	1 ml	0	0	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
VHSV genotypes (I, II, III, IVa, IVb)	Co-research	Yes	5 ml	0	0	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
VHSV Chimeric virus	Co-research	Yes	4 ml	0	0	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input 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(Kim et al. 2018)	1. Hyoung Jun Kim, Argelia Cuenca, Niels Jorgen Olesen (2018) Valication of a novel one-step reverse transcription polymerase chain reaction method for detecting viral haemorrhagic septicaemia virus (Aquaculture 492, 170-183) 2.Hyoung Jun Kim (2019) 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)
Cell culture method for optimal FBS concentration to support replication of Koi herpesvirus(Kim et al. 2020)	Hyoung Jun Kim, Se Ryun Kwon, Kei Yuasa (2020) Establishing the optimal fetal bovine serum concentration to support replication of cyprinid herpesvirus 3 in CCB and KF-1 cell lines

**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
INDONESIA	PCR positive control for DIV-1 gene detection	received an Official letter from national reference laboratory
INDIA	PCR positive control for DIV-1 gene detection	received an Official letter from national reference laboratory
MALAYSIA	PCR positive control for DIV-1 gene detection	received an Official letter from national 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	2017-2020	Infection trial using VHSV chimeric virus to rainbow trout	Dr. Niels Jorgen Olesen (DTU Aqua, OIE reference laboratory for VHS)	DENMARK
Cooperation researches by MOU between Korea and Japan	2018-2020	Molecular techniques for KHV	Dr. Kei Yuasa (National Research Institute of Aquaculture)	JAPAN

**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 2020, Our laboratory could not detect VHSV from several fish species in quarantine step.

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 2020, Our laboratory could not detect VHSV from several fish species in quarantine step.

**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: 3

Hyoung Jun Kim, Se Ryun Kwon, Kei Yuasa (2020) Establishing the optimal fetal bovine serum concentration to support replication of cyprinid herpesvirus 3 in CCB and KF-1 cell lines. *Journal of Virological Methods* 276, 113733

Jae Wook Jung, Jung Seok Lee, Jaesung Kim, Se Pyeong Im, Si Won Kim, Jassy Mary S. Lazarte, Young Rim Kim, Jin Hong Chun, Min Woo Ha, Na Na Kim, Kim D. Thompson, Hyoung Jun Kim, Tae Sung Jung (2020) Involvement of CD4-1 T cells in the cellular immune response of olive flounder (*Paralichthys olivaceus*) against viral hemorrhagic septicemia virus (VHSV) and nervous necrosis virus (NNV) infection. *Developmental and Comparative Immunology* 103, 103518

Jae Wook Jung, Jin Hong Chun, Jung Seok Lee, Si Won Kim, Ae Rin Lee, Jaesung Kim, Jassy Mary S. Lazarte, Young Rim Kim, Hyoung Jun Kim, Kim D. Thompson, Tae Sung Jung (2020) Characterization of CD4-Positive Lymphocytes in the Antiviral Response of Olive Flounder (*Paralichthys olivaceus*) to Nervous Necrosis Virus. *International Journal of Molecular Sciences* 21, 4180

b) International conferences: 2

Hyoung Jun Kim, Argelia Cuenca, Niels Jorgen Olesen (2020) Development and validation of a novel one-step conventional RT-PCR method for detecting viral haemorrhagic septicaemia virus : to revise a diagnostic method in current OIE manual. 2nd International symposium on aquatic animal health and diagnostics in Korea.

Hyoung Jun Kim (2020) Research and activities of the OIE reference laboratory for viral haemorrhagic septicaemia in Korea. 2nd meeting of the ad hoc steering committee of the regional collaboration framework on aquatic animals health.

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: 20

b) Seminars: 20

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, b	Ghana	2
a, b	Afghanistan	1
a, b	Egypt	1
a, b	Nepal	1
a, b	Tanzania	2
a, b	East Timor	1
a, b	Indonesia	2
a, b	Kenya	2
a, b	Uganda	2
a, b	Fiji	1
a, b	Sri Lanka	2
a, b	Ethiopia	2
a, b	Cameroon	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 ISO17025 NFQS.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Molecular techniques for VHS	KOLAS (Korea Laboratory Accreditation Scheme)
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
National	Cooperative research meeting (on-line)	Sunmoon University	05/20	NFQS (OIE reference laboratory)	5
National	Cooperative research meeting for COVID-19 diagnosis (MOU)	Heimbiotek	07/20	NFQS (OIE reference laboratory)	14
National	Cooperative research meeting	Sejong University	11/20	NFQS (OIE reference laboratory)	5
International	Cooperative research meeting	OIE reference laboratory for VHS in Denmark and Sunmoon University	4/20	On line	3
International	Cooperative research meeting	OIE reference laboratory for VHS in Denmark	10/20	On line	2

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
2nd T/C of the ad hoc steering committee of the regional collaboration framework on AAH	03/20	on-line	speaker	Expert of OIE reference laboratory for VHS
OIE Regional Virtual Meeting on DIV1	08/20	on-line	Short Communications	Expert of OIE reference laboratory for VHS
24th Annual Workshop for National Reference laboratories for fish diseases	11/20	on-line	Short Communications	Expert of OIE reference laboratory for VHS
11th Annual Workshop for National Reference laboratories for crustacean diseases	11/20	on-line	Short Communications	Expert of OIE reference laboratory for VHS
International Forum of Aquaculture for Silk Road Countries on the theme "Sustainable Aquaculture Development: Response Strategies Towards Post-pandemic"	11/20	on-line	Short communications	Expert of OIE reference laboratory for VHS
2nd meeting of ad hoc steering committee of the Regional Collaboration Framework on Aquatic Animal Health (Virtual meeting)	12/20	on-line	speaker	Expert of OIE reference laboratory for VHS

***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: <sup>1</sup>	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

<sup>1</sup> 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 Fishery Products Quality Management Service (NFQS, 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(NFQS) 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 <sup>1</sup>	No. participating laboratories	Region(s) of participating OIE Member Countries
To primarily assess the identification of the fish viruses: VHSV, IHNV, EHN, SVCV, IPNV, Ranavirus by cell culture based methods and molecular methods.	42	<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)
2nd T/C of the ad hoc steering committee of the regional collaboration framework on AAH	on line	Meeting between OIE experts and OIE focal point
OIE Regional Virtual Meeting on DIV1	on line	Consultation meeting between OIE focal points and OIE experts in Asia-Pacific region
2nd meeting of ad hoc steering committee of the Regional Collaboration Framework on Aquatic Animal Health	on line	Meeting between OIE experts and OIE focal point

25. Additional comments regarding your report:

Our twinning project between Korea and Denmark was considered as one of the most successful project in Asia region from both OIE HQ and OIE RR for Asia and the Pacific. So, OIE RR for Asia and the Pacific was requested to share the detail information about our OIE twinning project. In 2020, Dr. Kim and Dr. Olesen sent a file of final report of OIE twinning project between Korea and Denmark. Finally, our report can see on the website of OIE RR for Asia and the Pacific.

In 2020, reference materials as PCR positive control, developed based on its patented technology from the Dr. Kim to diagnose an emerging disease for shrimp (Decapod Iridescent Virus 1, DIV1), were provided to other countries' national laboratories for aquatic animal disease including Indonesia, India and Malaysia.

Additionally, the patented technology for prevention of PCR false-positive reaction by Dr. Kim was transferred to COVID-19 diagnostic company (Heimbiotek).