

OIE Reference Laboratory Reports Activities

Activities in 2019

This report has been submitted : 2020-01-22 17:06:53

Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Viral haemorrhagic septicaemia
Address of laboratory:	DTU Aqua Kemitorvet, Building 202 2800 Kgs, Lyngby DENMARK
Tel.:	+45 35 88 68 31
Fax:	
E-mail address:	njol@aqua.dtu.dk
Website:	https://www.dtu.dk/english/service/phonebook/person?id=39385&cpid=238608&tab=1
Name (including Title) of Head of Laboratory (Responsible Official):	Fritz Köster, Director of DTU Aqua
Name (including Title and Position) of OIE Reference Expert:	Niels Jørgen Olesen, Professor, head of unit
Which of the following defines your laboratory? Check all that apply:	Academic

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
ELISA	Yes	35	1
RT-PCR	Yes	0	0
IFAT	Yes	0	0
Direct diagnostic tests		Nationally	Internationally
Cell cultivation BF-2	Yes	747	1
Cell cultivation EPC	Yes	747	1
RT-qPCR	Yes	5	0

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
BF-2, EPC, CHSE-214 Cell cultures	Virus propagation	Yes	0	18 x 120 ml	5	<input checked="" type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Other cell lines (CCB, GF, ASK-1, RTG-2, FHM, SSN-1, WSSK, EK-1, KF1)	Virus propagation	Yes	0	10 x 120 ml	3	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
VHSV isolates of various genotypes	Positive controls, validations of tests etc	Yes	0	7 FTA Cards	2	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Other fish pathogen	For differential diagnosis, controls, validation etc.	Yes	0	4 ampoules, 16 cryotubes, 9 FTA Cards	9	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Monoclonal and polyclonal antibodies against VHSV	ELISA, IFAT, IHC, WB etc.	Yes	0	2 cryotubes	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Other antibodies for differential diagnosis	ELISA, IFAT, IHC, WB etc.	Yes	0	4 cryotubes	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East

Tissue material and slides	Histology	Yes	0	300 Histocassettes	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Plasmids	For expressing viral genes	Yes	0	3 tubes	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Fish sera	ELISA, Serum neutralisation	Yes	0	144 tubes	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" 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?

No

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

Yes

Name of the new test or diagnostic method or vaccine developed	Description and References (Publication, website, etc.)
DNA vaccine against viral haemorrhagic septicaemia	Time-course study of the protection induced by an interferon-inducible DNA vaccine against viral haemorrhagic septicaemia in rainbow trout (2019) Sepúlveda, Dagoberto ; Lorenzen, Ellen ; Rasmussen, Jesper Skou ; Einer-Jensen, Katja ; Collet, Bertrand ; Secombes, C. J. ; Lorenzen, Niels. Fish and Shellfish Immunology, vol: 85, pages: 99-105 DOI: https://doi.org/10.1016/j.fsi.2018.06.056
DNA vaccine against viral haemorrhagic septicaemia	DNA vaccination for finfish aquaculture (2019) Collins, Catherine ; Lorenzen, Niels ; Collet, Bertrand Fish and Shellfish Immunology, vol: 85, pages: 106-125 DOI: https://doi.org/10.1016/j.fsi.2018.07.012

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?

Yes

Name of OIE Member Country seeking assistance	Date (month)	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
IRELAND	January + March	0	26
SERBIA	May	0	1
NORWAY	July + September	0	6

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

No

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
Identification of virulence markers in two loss-making Novirhabdovirus is the key to improve diagnostic and strategic management in farmed rainbow trout (NOVIMARK)	2016--2019	Identification of virulence markers in VHSV and development of tests for discriminating between virulence properties	Institut National de la Recherche Agronomique (INRA); Agence Nationale de Sécurité Sanitaire (ANSES); Universidad de Santiago de Compostela (USC); Istituto Zooprofilattico Sperimentale delle Venezie (IZSVE); Centre for Environment Fisheries and Aquaculture Sciences (CEFAS); Technical University of Denmark (DTU)u	FRANCE ITALY SPAIN UNITED KINGDOM
Guest scientist Associated professor Se Ryun Kwon: study viral haemorrhagic septicaemia virus proteins responsible for virulence in rainbow trout by assessing pathogenicity of chimeric viruses.	2018-2019	By use of the platform for recombinant virus technology established at DTU chimeric viruses were produced by exchanging the gene encoding the N structural protein between high- and non-virulent genotype I strains of VHSV. The virulence and patterns of the chimeric viruses will be studied in-vitro in cell cultures and in-vivo in rainbow trout.	Sun Moon University, Republic of Korea	KOREA (REP. OF)
OIE Twinning project continuation and follow up	2018-2021	In-vivo testing of the virulence of Korean rhabdovirus isolates (IHNV and VHSV) to rainbow trout fry. In-vitro and in-vivo testing of chimeric VHSV genotype IVa exchanging the gene encoding for M and G protein of the 5 VHSV genotypes.	Kim, Hyoung Jun, Ph.D. National Fishery Products Quality Management Service, Haeyang-ro, Yeongdo-gu, Busan, Republic of Korea	KOREA (REP. OF)
Infection dynamics of Swedish IPN genogroup 6 to local landlocked Salmon and Trout fry compared to Rainbow Trout fry	2019	To investigate the infection dynamics of a new IPNV isolate to two of the four local Salmon and Trout stocks that are landlocked in lake Vänern, and that are at risk of exposure to the virus	DTU Aqua Denmark and SVA Sweden	SWEDEN

Red Mark Syndrome on rainbow trout: effect of temperature on disease development	2019	This study intends to show if and how variation in the water temperature in the cohabitation model can: 1) influence the development of the disease by observing macroscopically and histologically (microscopy) the lesions. 2) influence the pathogen load by measuring it with qPCR.	DTU Aqua and University of Udine, Italy	ITALY
--	------	---	---	-------

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?

Yes

If the answer is yes, please provide details of the data collected:
We conduct an annual survey on fish diseases in Europe. The report can be found on https://www.eurl-fish-crustacean.eu/fish/survey-and-diagnosis

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

Yes

If the answer is yes, please provide details of the data collected:
The report was presented and discussed at the 23rd Annual Workshop of the National Reference Laboratories for Fish Diseases, 27th - 28th of May, DTU Aqua, 2800 Kgs. Lyngby, Denmark.

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: 14

1. Lumpfish (*Cyclopterus lumpus*, Linnaeus) is susceptible to viral nervous necrosis: Result of an experimental infection with different genotypes of Betanodavirus. (2019) Toffan, Anna ; De Salvador, Maria ; Scholz, Felix ; Pretto, Tobia ; Buratin, Alessandra ; Rodger, Hamish D ; Toson, Marica ; Cuenca, Argelia ; Vendramin, Niccolò. 2019. Journal of Fish Diseases, vol: 42, issue: 12, pages: 1667-1676 DOI: <https://doi.org/10.1111/jfd.13088>

2. Outbreak of viral haemorrhagic septicaemia (VHS) in lumpfish (*Cyclopterus lumpus*) in Iceland caused by VHS virus genotype IV (2019). Guðmundsdóttir, Sigríður ; Vendramin, Niccolò ; Cuenca, Argelia ; Sigurðardóttir, Heiða ; Kristmundsson, Arni ; Moesgaard Iburg, Tine ; Olesen, Niels Jørgen. (2019) Journal of Fish Diseases, vol: 42, issue: 1, pages: 47-62 DOI: <https://doi.org/10.1111/jfd.12910>

3. Piscine orthoreovirus subtype 3 (PRV-3) causes heart inflammation in rainbow trout (*Oncorhynchus mykiss*). (2019) Vendramin, Niccolò ; Kannimuthu, Dhamotharan ; Olsen, Anne Berit ; Cuenca, Argelia ; Teige, Lena

Hammerlund ; Wessel, Øystein ; Moesgaard Iburg, Tine ; Dahle, Maria Krudtaa ; Rimstad, Espen ; Olesen, Niels Jørgen. *Veterinary Research* 2019, vol: 50, issue: 1. DOI: <https://doi.org/10.1186/s13567-019-0632-4>

4. Presence and genetic variability of Piscine orthoreovirus genotype 1 (PRV-1) in wild salmonids in Northern Europe and North Atlantic Ocean. (2019) Vendramin, Niccolò ; Cuenca, Argelia ; Sørensen, Juliane ; Alencar, Anna Luiza Farias ; Christiansen, Debes H ; Jacobsen, Jan A ; Axen, Charlotte ; Liefbrig, François ; Ruane, Neil M ; Martin, Patrick ; Sheehan, Timothy ; Iburg, Tine M ; Rimstad, Espen ; Olesen, Niels Jørgen. *Journal of Fish Diseases* 2019, vol: 42, issue: 8, pages: 1107-1118. DOI: <https://doi.org/10.1111/jfd.13025>

5. Sequencing of animal viruses: quality data assurance for NGS bioinformatics. Zamperin, Gianpiero ; Lucas, Pierrick ; Cano, Irene ; Ryder, David ; Abbadi, Miriam ; Stone, David ; Cuenca, Argelia ; Vigouroux, Estelle ; Blanchard, Yannick ; Panzarin, Valentina. *Virology Journal* 2019, vol: 16. DOI: <https://doi.org/10.1186/s12985-019-1223-8>

6. Sequential Immunization With Heterologous Viruses Does Not Result in Attrition of the B Cell Memory in Rainbow Trout (2019) Navelsaker, Sofie ; Magadan, Susana ; Jouneau, Luc ; Quillet, Edwige ; Olesen, Niels Jørgen ; Munang'andu, Hetron Mweemba ; Boudinot, Pierre ; Evensen, Øystein. *Frontiers in Immunology*, Vol 10: DOI: <https://doi.org/10.3389/fimmu.2019.02687>

7. Skin immune response of rainbow trout (*Oncorhynchus mykiss*) experimentally exposed to the disease Red Mark Syndrome (2019) Jørgensen, Louise von Gersdorff ; Schmidt, Jacob Günther ; Chen, Defang ; Kania, Per Walter ; Buchmann, Kurt ; Olesen, Niels Jørgen in: *Veterinary Immunology and Immunopathology*, vol: 211, pages: 25-34

8. The susceptibility of silver crucian carp (*Carassius auratus langsdorffii*) to infection with koi herpesvirus (KHV) (2019) Kim, Hyoung Jun ; Kwon, Se Ryun ; Olesen, Niels Jørgen ; Yuasa, Kei in: *Journal of Fish Diseases*, vol: 42, issue: 10, pages: 1333-1340. DOI: <https://doi.org/10.1111/jfd.13054>

9. Time-course study of the protection induced by an interferon-inducible DNA vaccine against viral haemorrhagic septicaemia in rainbow trout (2019) Sepúlveda, Dagoberto ; Lorenzen, Ellen ; Rasmussen, Jesper Skou ; Einer-Jensen, Katja ; Collet, Bertrand ; Secombes, C. J. ; Lorenzen, Niels. *Fish and Shellfish Immunology*, vol: 85, pages: 99-105 DOI: <https://doi.org/10.1016/j.fsi.2018.06.056>

10. DNA vaccination for finfish aquaculture (2019) Collins, Catherine ; Lorenzen, Niels ; Collet, Bertrand *Fish and Shellfish Immunology*, vol: 85, pages: 106-125 DOI: <https://doi.org/10.1016/j.fsi.2018.07.012>

11. A pentavalent vaccine for rainbow trout in Danish aquaculture (2019) Marana, Moonika H ; Sepulveda Araneda, Dagoberto Andres ; Chen, Defang ; Al-Jubury, Azmi ; Jaafar, Rzgar M ; Kania, Per W ; Henriksen, Niels Henrik ; Krossøy, Bjørn ; Dalsgaard, Inger ; Lorenzen, Niels ; Buchmann, Kurt. *Fish and Shellfish Immunology*, vol: 88, pages: 344-351 DOI: <https://doi.org/10.1016/j.fsi.2019.03.001>

12. *Pichia pastoris* yeast as a vehicle for oral vaccination of larval and adult teleosts (2019) Embregts, Carmen W.E. ; Reyes-Lopez, Felipe ; Pall, Adina C. ; Stratmann, Ansgar ; Tort, Luis ; Lorenzen, Niels ; Engell-Sorensen, Kirsten ; Wiegertjes, Geert F. ; Forlenza, Maria ; Sunyer, J. Oriol ; Parra, David. *Fish and Shellfish Immunology*, vol: 85, pages: 52-60 DOI: <https://doi.org/10.1016/j.fsi.2018.07.033>

13. Detection of Salmonid IgM Specific to the Piscine Orthoreovirus Outer Capsid Spike Protein Sigma 1 Using Lipid-Modified Antigens in a Bead-Based Antibody Detection Assay. Lena Hammerlund Teige, Subramani Kumar, Grethe M. Johansen, Øystein Wessel, Niccolò Vendramin, Morten Lund, Espen Rimstad, Preben Boysen and Maria K. Dahle* <https://www.frontiersin.org/articles/10.3389/fimmu.2019.02119/full>

14. Detection of piscine orthoreoviruses (PRV-1 and PRV-3) in Atlantic salmon and rainbow trout farmed in Germany Adamek, M., Hellmann, J., Fla A., Teitge, F., Vendramin, N., Fey, D., Riße, K., Blakey, F., Rimstad, E. & Steinhagen, D., 2019, In : *Transboundary and Emerging Diseases*. 66, 1, p. 14-21 <https://doi.org/10.1111/tbed.13018>

b) International conferences: 12

The 23rd Annual Workshop of the National Reference Laboratories for Fish Diseases, 27th – 28th of May, DTU Aqua, 2800 Kgs. Lyngby, Denmark.

- Update on red mark syndrome (RMS), Jacob Günther Schmidt
- Susceptibility of European Seabass to VHSV and IHNV, Jacob Günther Schmidt
- Full genome sequence analysis of VHSV, in the search of virulence markers Argelia Cuenca.

- Overview of the disease situation in Europe , Niccolò Vendramin
- Piscine orthoreovirus (PRV-3) associated disease in RAS Niccolò Vendramin
- Distribution and variability of PRV-3 in Denmark Juliane Sørensen
- Results of the Proficiency Test, PT1 and PT2, 2018 Niccolò Vendramin and Teena Vendel Klinge
- Experience gained from Inter-laboratory proficiency test for fish viral diseases Niels Jørgen Olesen
- EURL Training Courses. Topics and organization of courses 2019 N. Vendramin and T. Iburg
- Phage therapy against *Flavobacterium psychrophilum* Valentina Laura Donati
- Cell susceptibility, genotypes and virulence in rainbow trout of VHSV Anna Luiza Alencar
- EURL activities in 2018 Niels Jørgen Olesen
- EURL Work Plan for 2019 and ideas and plans for 2020-21 Niels Jørgen Olesen
- Next meeting and end of 23rd Annual Workshop Niels Jørgen Olesen

The 10th Annual Workshop of the National Reference Laboratories for Crustacean Diseases, 29th of May, DTU Aqua, 2800 Kgs. Lyngby, Denmark

- The proficiency test in crustacean diseases 2019 Argelia Cuenca
- EURL activities 2018 -Accreditation of WSSV diagnosis Camilla Priess and Argelia Cuenca
- Listing infectious diseases in crustaceans and selection of diagnostic method (Plenum discussion). Chaired by Niels Jørgen Olesen
- EURL activities 2018 -Accreditation of WSSV diagnosis Camilla Priess
- EURL Work Plan 2019-20 Niels Jørgen Olesen

The 19th International Conference on Diseases of Fish and Shellfish, 9th - 12th of September, Porto, Portugal.

ORAL PRESENTATIONS

- Effect of antibiotic in-feed treatment against red mark syndrome in rainbow trout, Jacob Günther Schmidt and Niels Jørgen Olesen
- Rainbow trout Red Mark Syndrome - a standardised approach to histopathological classification, Massimo Orioles, Jacob Günther Schmidt, Tine M. Iburg, Marco Galeotti.
- Piscine orthoreovirus-3 (PRV-3), a new pathogen for farmed rainbow trout. Argelia Cuenca (on behalf of NJ Olesen).
- Molecular basis for VHSV virulence in rainbow trout. Panzarini V and Argelia Cuenca.
- Virulence factors in VHSV: Which replication step is responsible for VHSV strains virulence? López-Vázquez C, Panzarini V, Toffan A, Blanchard Y, Bremont M, Olesen NJ, Stone D, Morin T, Bandín I and Dopazo CP
- Construction of a qPCR-based microarray for diagnosis, typing and evaluation of virulence of VHSV strains López-Vázquez C., Oliveira JG, Olesen NJ, Panzarini V, Gastaldelli M, Blanchard Y, Stone D, Morin T, Bremont M, Bandín I and Dopazo CP
- DNA vaccination against VHS - does it work in all fish species D. Sepulveda, N. Vendramin, N.J. Olesen and N. Lorenzen

EAFP histopathology workshop, Porto, Portugal, 8 September 2019

IABS (International Alliance for Biological Standardization) Diagnostics in the veterinary field: The role in health surveillance and disease identification, May 15 - 17, 2019, Wiesbaden, Germany:

- Experience from ringtests among European national reference laboratories for surveillance of viral infections in fish Niels Jørgen Olesen

Laksekonferencen. Conference arranged by Denmark's Center for Wild Salmon on occasion of the international year of wild salmon, 11th of October, Skjern, Denmark

- Sygdomsudfordringer for vilde laksen i Danmark, Jacob Günther Schmidt
- 4th meeting of the NOVIMARK/ANHIWA project. Copenhagen, Denmark. March 2019
- Data mining, phylogenetic analysis, mapping of characters and selective pressures for identifying virulence markers in the full genome of VHSV. (Argelia Cuenca. oral presentation)
 - Development of reverse genetics at DTU Anna Alencar
 - Cell susceptibility, genotypes and virulence in rainbow trout Niels J. Olesen
- PD trination 2019. Dublin, Ireland.
- Presence and genetic variability of PRV-3 in Denmark. Argelia Cuenca.
 - Piscine orthoreovirus-3 (PRV-3), a new pathogen for farmed rainbow trout Niccolò Vendramin,

The 5th Workshop on Recirculating Aquaculture Systems (RAS) Estrel Congress Center, Berlin, Germany 7-8 October 2019

Piscine orthoreovirus-3 (PRV-3), a new pathogen for farmed rainbow trout 39 N. Vendramin et al.

Workshop on the recently observed disease and mortality in wild salmon , Oslo, Norway, November 19th to 20th 2019:

- Report on diseases in wild Atlantic salmon in Denmark Niels Jørgen Olesen

OIE Global Conference on Aquatic Animal Health, Santiago de Chile, Chile 2-4 April 2019 Olesen NJ
Training course and workshop on control of parasitic diseases in aquacultured fish -innate and acquired resistance, KU-Sund, Copenhagen April 30th, 2019

- The risk of transmission of infectious disease through trade of cryopreserved milt N. J. Olesen
- Health management of cleanerfish in salmon farming, Niccoló Vendramin

c) National conferences: 0

d) Other:

(Provide website address or link to appropriate information) 2

<https://www.aqua.dtu.dk/english/Research/Fish-and-shellfish-diseases> and <https://www.eurl-fish-crustacean.eu/>

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: 7

b) Seminars: 68

c) Hands-on training courses: 74

d) Internships (>1 month): 6

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
b	Austria	1
b+c/b	Belgium/ Netherlands	3+1 / 1
b	Bosnia&Herzegovina	1
b+c	Bulgaria	1 + 1
b	Romania	1 + 3
b+c	Croatia	1 + 1
b+c+d	Slovenia	1+3+1
b+c / b+c	Czech Republic / Slovakia	2+4 / 1+1
b+c+d / a+b	Denmark / Faroe Island	14+11+1 / 3+1
b / b / b+c	Estonia / Latvia / Lithuania	1 / 2 / 1+1
b	Finland	2
b+c	France	2+3
b	Germany	1
b+c	Greece	1+4
b+c	Hungary	1 + 8
b+c	Iceland	2+2
c/c	Indonesia / Brazil	2 / 1
b+c	Ireland	2 + 1
b+c+d	Italy	3 + 5 + 2
a+b+c	Norway	3+5+2
b+c	Poland	3+4
b	Portugal	1
b+c / a+b+c	England / Scotland	4+3 / 1+2+4
b	Serbia	1
b+c	Spain	2 + 4
b+c	Sweden	2 + 3

b	Switzerland	1
d	Republic of Korea	2
c	Turkey	1
c	China	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)
DS/EN ISO/IEC17025:2005	Akk 588 dk-uk.pdf
DS/EN ISO/IEC 17043:2010	Akk 515 dk-uk.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
VHSV Cell cultivation	DANAK 17025:2005
VHSV IFAT	DANAK 17025:2005
VHSV ELISA	DANAK 17025:2005
VHSV RT-PCR	DANAK 17025:2005
IHNV Cell cultivation	DANAK 17025:2005
IHNV IFAT	DANAK 17025:2005
IHNV ELISA	DANAK 17025:2005
IPNV Cell cultivation	DANAK 17025:2005
IPNV ELISA	DANAK 17025:2005
ISA RT-PCR	DANAK 17025:2005
Renibacterium salmoninarum ELISA	DANAK 17025:2005
KHV PCR	DANAK 17025:2005
EHNV cell cultivation	DANAK 17025:2005
EHNV PCR	DANAK 17025:2005
SVCV Cell cultivation	DANAK 17025:2005
SVCV ELISA	DANAK 17025:2005
Proficiency test for viruses in fish	DANAK 17043:2010

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?

No

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
OIE Global Conference on Aquatic Animal Health	04/19	Santiago de Chile, Chile	delegate	not relevant
OIE Aquatic Animal Health ad-hoc Working group on susceptible species			WG member	not relevant

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 2018 on identification of the pathogens causing the non-exotic and exotic fish diseases listed in Council Directive 2006/88/EC	Organizer	49	5

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 Veterinary Institute of the Kingdom of Denmark and the National fishery products Quality management service of The republic of Korea on Cooperative research project For fish diseases 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.	National Fishery Products Quality Management Service of the Republic of Korea and the National Veterinary Institute of Denmark

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: viral haemorrhagic septicaemia virus (VHSV), infectious hematopoietic necrosis virus (IHNV), epizootic haematopoietic necrosis virus (EHNV), spring viraemia of carp virus (SVCV), and infectious pancreatic necrosis virus (IPNV) by cell culture based methods	49	<input checked="" 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: infectious salmon anaemia virus (ISAV), salmonid alphavirus and Cyprinid herpesvirus 3 (CyHV-3) (otherwise known as koi herpes virus - KHV) by biomolecular methods (PCR based).	46	<input checked="" 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)
OIE Aquatic Animal Health Ad hoc working group on susceptible species	OIE Rue Prony, Paris	Assessment of the species susceptible to the fish diseases listed in the Aquatic Animal Health Code

25. Additional comments regarding your report: