

WOAH Reference Laboratory Reports Activities 2023

Activities in 2023

This report has been submitted : 4 juin 2024 09:35

Laboratory Information

Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:	Viral encephalopathy and retinopathy
Address of laboratory:	WOAH Reference Laboratory for Viral Encephalopathy and Retinopathy of Marine Fish, Fish virology Dep., Istituto Zooprofilattico Sperimentale delle Venezie (IZSve) Viale dell'Università, 10 35020 Legnaro (Padova), Italy
Tel.:	+39-049 808 43 88
E-mail address:	atoffan@izsvenezie.it
Website:	https://www.izsvenezie.it/
Name (including Title) of Head of Laboratory (Responsible Official):	Calogero Terregino, Director of the Specialized Virology and Experimental Research Unit/Acting Director of the Research and Development Department (IZSve)
Name (including Title and Position) of WOAH Reference Expert:	Anna Toffan DVM PhD, Head of Fish virology Dep.
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	
		Nationally	Internationally
Indirect diagnostic tests			
ELISA		220	59
Direct diagnostic tests			
Cell Culture		3	33
Real-time RT-PCR(rRT-PCR)		375	973
Immunohistochemistry (IHC)		0	5
Molecular characterization (RT-PCR and sequencing analysis)		0	14

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
SSN-1 cell	Virus isolation	produced	10 ml	11 ml	2	ITALY, TUNISIA,

Live betanodavirus reissantant	Virus isolation, RT-PCR, rRT-PCR	stored	0 ml	0,5 ml	1	TUNISIA,
Live betanodavirus RGNNV	Virus isolation, RT-PCR, rRT-PCR	stored	1 ml	0,5 ml	2	ITALY, TUNISIA,
Inactivated betanodavirus RGNNV	Virus isolation, RT-PCR, rRT-PCR	stored	0,5 ml	1,5 ml	2	ITALY, TUNISIA,
Live betanodavirus (other strains)	RT-PCR, rRT-PCR	stored	0,5 ml	0 ml	1	ITALY,
Concentrated ELISA Antigen	ELISA	produced	1,5 ml	1 ml	2	ITALY, TUNISIA,
Characterized sea bass serum	ELISA	stored	0 ml	10 x 0,5ml each	1	TUNISIA,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAHA Members?

No

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 WOAHA Standards for the designated pathogen or disease?

No

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

No

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

No

TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

NAME OF WOAHA MEMBER COUNTRY SEEKING ASSISTANCE	DATE	WHICH DIAGNOSTIC TEST USED	NO. SAMPLES RECEIVED FOR PROVISION OF DIAGNOSTIC SUPPORT	NO. SAMPLES RECEIVED FOR PROVISION OF CONFIRMATORY DIAGNOSES
CYPRUS	2023-03-01	Real time PCR	12	0
CROATIA	2023-03-01	Real time PCR	1	0
FRANCE	2023-01-01	Real time PCR, ELISA	153	0
ISRAEL	2023-09-01	Real time PCR, genotyping	37	2
MALTA	2023-11-01	Real time PCR, cell culture	50	3
NORWAY	2023-11-06	Real time PCR, genotyping	7	11
SPAIN	2023-01-01	Real time PCR-genotyping, cell culture	765	17
THE NETHERLANDS	2023-04-01	Real time PCR	7	0
UNITED KINGDOM	2023-02-01	Cell culture	0	14

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

Yes

NAME OF THE WOAHA MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY	PURPOSE	HOW THE ADVICE WAS PROVIDED
CYPRUS	Diagnosis and control of VER	Diagnostic support and remote assistance
FRANCE	Diagnosis and control of VER	Diagnostic support and remote assistance
ISRAEL	Diagnosis and control of VER	Diagnostic support and remote assistance

MALTA	Diagnosis and control of VER	Diagnostic support and remote assistance
NORWAY	Diagnosis and control of VER	Virus characterization and exchange of viral strain
SPAIN	Diagnosis and control of VER	Diagnostic support and remote assistance
TUNISIA	Cell culture and ELISA set up	Training and reagents provision

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
VetBioNet	5 years	Veterinary Biocontained facility Network for excellence in animal infectiology research and experimentation	www.vetbionet.eu/consortium/ 1. Institut National de la Recherche Agronomique (France) 2. Stichting Dienst Landbouwkundig Onderzoek (Netherlands) 3. Friedrich Loeffler Institut (Germany) 4. The Pirbright Institute LBG (UK) 5. The Secretary of State for Environment, Food and Rural Affairs (UK) 6. Moredun Research Institute (UK) 7. Instituto Nacional de Investigacion y Tecnologia Agraria y Alimentaria (Spain) 8. Institut De Recerca I Tecnologia Agroalimentaries (Spain) 9. Eidgenoessisches Departement Des Innern (Switzerland) 10. Panstwowy Instytut Weterynaryjny - Panstwowy Instytut Badawczy (Poland) 11. Marine Scotland (UK) 12. Aarhus Universitet (Denmark) 13. Agence Nationale de Securite Sanitaire de L'alimentation, de L'environnement et du Travail (France) 14. The University of Edinburgh (UK) 15. Erasmus Universitair Medisch Centrum Rotterdam (Netherlands) 16. Istituto Zooprofilattico Sperimentale delle Venezie (Italy) 17. The University of Nottingham (UK) 18. University College Dublin, National University of Ireland (Ireland) 19. International Livestock Research Institute (Kenya) 20. Commonwealth Scientific and Industrial Research Organisation (Australia) 21. Federazione Europea di Zootecnica (Italy) 22. Inscreenex Gmbh (Germany) 23. Leica Microsystems Cms Gmbh Ernst-Leitz (Germany) 24. Noldus Information Technology Bv (Netherlands) And other 5 participants	AUSTRALIA DENMARK FRANCE GERMANY IRELAND ITALY KENYA POLAND SPAIN SWITZERLAND THE NETHERLANDS UNITED KINGDOM
PathoGelTrap - New Blue Revolution through a pioneering pathogen-trapping technology based on bioselective hydrogel-forming proteins - H2020 EU Project (2020-2023)	3 years	To innovate infectious disease management practices, providing industry with a technology capable of effectively removing specific pathogens directly from water.	1. Smartwaterplanet, high-tech SME specialized in the development of technology solutions for the aquaculture sector. Madrid, Spain; 2. The Higher Council for Scientific Research (CSIC - State Agency for scientific research and technological development) Madrid, Spain; 3. University College Dublin (UCD) Ireland; 4. IZSve, Italy; 5. IFPAN Institute of Physics, Polish Academy of Sciences, Warsaw, Poland. 6. LOMARTOV environmental engineering SME, specialized in supporting R&D, industrial and technology-based projects with a multidisciplinary approach, Valencia, Spain. https://pathogeltrap.eu/project	IRELAND ITALY POLAND SPAIN
			Advisors: Norwegian Veterinary Institute -	

AQUAE-STRENGHT	3 years	Strengthening capacity on aquatic animal health and epidemiological surveillance	NORWAY • Technical University of Denmark – DENMARK • Centre for Environment, Fisheries and Aquaculture Science – UK Beneficiaries: Institut National des Sciences et Technologies de la Mer – Laboratoire D'Aquaculture – TUNISIA • Office National de Sécurité Sanitaire des Produits Alimentaires - MOROCCO • Ministry of Agriculture, Forestry and Rural Development – Israeli Veterinary Services and Animal Health – ISRAEL • Ministry of Agriculture, Forestry and Fisheries – Fisheries Administration (Maff) – CAMBODIA	CAMBODIA DENMARK ISRAEL MOROCCO NORWAY TUNISIA UNITED KINGDOM
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13. In exercising your activities, have you identified any regulatory research needs* relevant for WOA?

Yes

Research need : 1

Please type the Research need: The withdrawal of the chapter devoted to Viral encephalopathy and retinopathy in the new edition of The WOA Aquatic Code brought to light some regulatory gaps and needs of additional technical documents. In particular the lack of guidelines recommending the recongnised laboratory methods emerged after the publication of the new Aquatic Manual last May 2022.

Relevance for WOA Standard Setting,

Relevance for the Codes or Manual Manual,

Field Epidemiology and Surveillance, Diagnostics,

Animal Category Aquatic,

Disease:

Viral encephalopathy and retinopathy

Kind of disease (Zoonosis, Transboundary diseases) Transboundary diseases,

If any, please specify relevance for Codes or Manual, chapter and title

(e.g. Terrestrial Manual Chapter 2.3.5 - Minimum requirements for aseptic production in vaccine manufacture)

Answer:

Notes:

Answer:

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:

Data repository of NNV strains/sequence collected during mortality events in groupers (*Epinephelus* spp.) in the Mediterranean basin; Data collected from NNV outbreaks in sea bream that occurred in European hatchery; Data obtained from questionnaires sent in the frame of the proficiency test organized by the RL.

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:

- Through publication of peer reviewed articles at international level and supporting other laboratories in manuscript writing; through participation to international scientific conferences (i.e. organised by EAFP-European Association of fish Pathology, EAS- European Aquaculture Society).
- As partner of EVAg which is a non profit organization based on a global network of virology experts to collect, characterize, standardize, authenticate, and distribute viruses and derived products. An international group of 36 laboratories, including 29 EU and 7 non-EU institutions, are actively involved in this project and represent a wide range of virological disciplines. IZSve has made viruses of veterinary interest and derived products available to the international scientific community. In particular the viral archive of aquatic viruses has been added to this catalog, including all known Betanodavirus species (RGNNV, SJNNV, TPNNV, BFNNV and reassortant strains).

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:

1

1. Cook, K. A., Hawke, J. P., Groman, D. d B., Pretto, T., Toffan, A., Hanson, L. A., Nguyen, D., Baumgartner, W. A. (2023). *Betanodavirus meningoencephalitis in an Atlantic blue marlin (Makaira nigricans, Lacépède, 1802) Journal of Veterinary Diagnostic Investigation. 2024 Feb 8:10406387231218223. doi: 10.1177/10406387231218223. Epub ahead of print.*

b) International conferences:

4

1. Lorena Biasini, Lucia Vázquez-Salgado, Francesco Pascoli, Andrea Marsella, Alessandra Buratin, Tobia Pretto, Miriam Abbadì, Erica Melchiotti, Isabel Bandín, Anna Toffan (2023). *Role of rotifers in Betanodavirus transmission to European sea bass larvae. Abstract Book (pag. 13). 21st EAFP Conference - European Association of Fish Pathologists, Aberdeen (UK), 11-14 September 2023*

2. Francesco Pascoli, Gaia Bacchin, Alessandra Buratin, Fabrizio Grieco, Anna Toffan (2023). *Pilot study of behavioural analysis in European sea bass (Dicentrarchus labrax) infected with VNNv (pag. 191) 21st EAFP Conference - European Association of Fish Pathologists, Aberdeen (UK), 11-14 September 2023*

3. Anna Toffan, Miriam Abbadì, Alessandra Buratin, Lorena Biasini, Francesca Ellero, Marilena Carrino (2023). *European Virus Archives-Global boosts research in aquaculture (pag. 214). 21st EAFP Conference - European Association of Fish Pathologists, Aberdeen (UK), 11-14 September 2023*

4. Snježana Zrnčić, Pantelis Katharios, Francesc Padrós, Marialetizia Fioravanti, Andrea Gustinelli, Anna Toffan. (2023) *New Challenges and Achievement in the Mediterranean Fish Health Management (pag.6). 21st EAFP Conference - European Association of Fish Pathologists, Aberdeen (UK), 11-14 September 2023;*

c) National conferences:

0

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

11

Article on national Journal (1)

Toffan, A., Buratin, A., Toson, M., Pascoli, F., Ellero, F., Drago, A., Cecchetti, K., & Abbadì, M. (2023). *Il circuito internazionale interlaboratorio per la Encefalo-retinopatia Virale (VER-IPT): risultati delle prime quattro edizioni. The international interlaboratory circuit for Viral Encephalo-Retinopathy (VER-IPT): results of the first four editions, Ittiopatologia 20, volume 3, pag 87-102;*

Projects at National level (2):

1. RC 13/22 VERTICAL – “Study on vertical transmission of immunity and VER virus infection in sea bream” (the RL participates as principal investigator). *Funded by the Italian Ministry of Health*

2. *Study to identify genetic markers associated to Viral Encephaloretinopathy (VER) resistance in experimentally infected sea bass (Dicentrarchus labrax). Research agreement with the University of Padua, Dept. of Comparative Biomedicine and Nutrition –BCA*

Working groups (1):

Participation in the national network of the IIZZSS (Istituti Zooprofilattici) for the study of stranded aquatic animals. Through technical and scientific assistance to the Ministry of Health, the aim of the network is to develop surveillance strategies and disease control in aquatic populations that are vulnerable to stranding.

Links from IZSVE's web site (7):

National reference laboratory for fish, crustacean and mollusc pathology / OIE reference laboratory for viral encephalopathy and retinopathy of marine fish
<http://www.izsvenezie.com/reference-laboratories/fish-crustacean-and-mollusc-pathology/>

IZSVE's contribution to VETBIONET:

<https://www.izsvenezie.com/vetbionet-network/>

EU Horizon 2020 to VETBIONET (Veterinary Biocontained facility Network for excellence in animal infectious disease research and experimentation):

<http://www.vetbionet.eu/>

IZSVE's contribution to Pathogeltrap:

<https://www.izsvenezie.it/proteine-intelligenti-catturano-virus-batteri-pesci/>

<https://pathogeltrap.eu/>

IZSVE's contribution to AQUAE STRENGTH:

<https://www.izsvenezie.it/progetto-aquae-strength/>

Regional Workshop for WOA National Focal Points for Aquatic Animals. Chioggia (Italy), 18th-20th October 2023

<https://www.izsvenezie.com/regional-workshop-woah-aquatic-animals-chioggia-italy-18-20-october-2023/>

IZSve included in the European Commission's list of "Key innovators" thanks to two sustainable aquaculture projects

<https://www.izsvenezie.com/izsve-key-innovators-list-european-commission-aquaculture-projects/>

A cooperation project in the field of aquaculture takes IZSve on a mission to Cambodia

<https://www.izsvenezie.com/cooperation-project-aquaculture-izsve-mission-cambodia/>

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOA Members?

Yes

a) Technical visit : 0

b) Seminars : 0

c) Hands-on training courses: 6

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	CAMBODIA	5
C	TUNISIA	1

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
UNI CEI EN ISO/IEC 17025:2018	Pdf	1_Certificato di accreditamento Laboratori di prova.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Virus Isolation in Cell Cultures	ACCREDIA – Italian Accreditation System

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

Yes

The RL implements biorisk management actions to prevent diseases among personnel and to protect the community from harm caused by potentially infectious pathogens. Particular attention is also paid to the safe transport management of infectious substances according to IATA guidelines and UN classification system. At IZSve, since 2013, there exists a Biosafety Committee responsible for the following tasks: - Evaluation of the safety risks for workers and for the environment connected to the activities to be performed under BSL3 conditions that involve the use of microorganisms, animals and Genetically Modified Microorganisms MOGM; - Evaluation of the emergency procedures - Evaluation of all the management and operative procedures to be applied inside the BSL-3 laboratory and animal facilities including potential biosecurity issues. All Standard Operative Procedures (SOPs) and handling of pathogens are written and performed accordingly to the WHO Laboratory Biosafety Manual (4th Ed.).

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOA?

Yes

NATIONAL/ INTERNATIONAL	TITLE OF EVENT	CO-ORGANISER	DATE (MM/YY)	LOCATION	NO. PARTICIPANTS
	Workshop "WOAH National Focal Points				

International	for Aquatic Animals" https://rr-europe.woah.org/en/news/regional-workshop-for-woah-national-focal-points-for-aquatic-animals-iv-cycle-empowering-aquaculture-for-a-sustainable-future/	WOAH	2023-10-18	Chioggia (VE), Italy	57
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22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOA?H?

No

TOR10: NETWORK WITH WOA?H REFERENCE LABORATORIES

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

Not applicable (only WOA?H Reference Laboratory designated for the disease)

24. Do you network (collaborate or share information) with other WOA?H Reference Laboratories designated for the same pathogen?

Not applicable (Only WOA?H Reference Laboratory designated for the disease)

25. Did you organise or participate in inter-laboratory proficiency tests with WOA?H Reference Laboratories designated for the same pathogen?

Not applicable (Only WOA?H Reference Laboratory designated for the disease)

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

Not applicable (Only WOA?H 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 WOA?H Reference Laboratories for the same pathogen?

Yes

Purpose for inter-laboratory test comparisons ¹	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the Test	WOAH Member Countries
Every two years the NRL organises and conducts the Viral Nervous Necrosis Interlaboratory Proficiency Test (VER-IPT) for molecular detection of Betanodavirus. Past edition: 2022	Organiser. The NRL organises and conducts the VER-IPT on Behalf of the WOA?H.	25	viral encephalopathy and retinopathy (VER)	CANADA, CROATIA, DENMARK, FRANCE, GERMANY, ITALY, MALAYSIA, NORWAY, SAUDI ARABIA, SLOVENIA, SPAIN, SWEDEN, THE NETHERLANDS, TUNISIA, TURKEY, UNITED KINGDOM, UNITED STATES OF AMERICA,

TOR12: EXPERT CONSULTANTS

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

Yes

KIND OF CONSULTANCY	Location	SUBJECT (FACULTATIVE)
Collaboration of the IZSVe with WOA?H in the organization and 2 oral presentations at the « Regional Workshop for WOA?H National Focal Points for Aquatic Animals »	Chioggia (Venice, Italy) 18 – 20/10/ 2023	https://rr-europe.woah.org/en/news/regional-workshop-for-woah-national-focal-points-for-aquatic-animals-iv-cycle-empowering-aquaculture-for-a-sustainable-future
Mission in the frame of the AQUAE STRENGTH project	Cambodia 16-25/03/23	Experts visiting the beneficiary country to provide an assessment of protocols for fish production and disease surveillance and control
Mission in the frame of the AQUAE STRENGTH project	Morocco 08-13/5/23	Experts visiting the beneficiary country to provide an assessment of protocols for fish production and disease surveillance and control
Mission in the frame of the AQUAE STRENGTH project	Israel 16-20/04/23	Experts visiting the beneficiary country to provide an assessment of protocols for fish production and disease surveillance and control
Mission in the frame of the AQUAE STRENGTH project	Tunisia 05-08/06/23	Experts visiting the beneficiary country to provide an assessment of protocols for fish production and disease surveillance and control

29. Additional comments regarding your report: