

# WOAH Reference Laboratory Reports Activities 2022

## Activities in 2022

This report has been submitted : 26 avril 2023 10:59

### Laboratory Information

<b>Name of disease (or topic) for which you are a designated WOA Reference Laboratory:</b>	Viral encephalopathy and retinopathy
<b>Address of laboratory:</b>	WHO 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
<b>Tel.:</b>	+39-049 808 43 88
<b>E-mail address:</b>	atoffan@izsvenezie.it
<b>Website:</b>	<a href="https://www.izsvenezie.it/">https://www.izsvenezie.it/</a>
<b>Name (including Title) of Head of Laboratory (Responsible Official):</b>	Calogero Terregino, Director of the Research and Development Department/acting Director of the Specialized Virology and Experimental Research Unit (IZSVe)
<b>Name (including Title and Position) of WOA Reference Expert:</b>	Anna Toffan DVM PhD, Head of Fish virology Dep.
<b>Which of the following defines your laboratory? Check all that apply:</b>	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 WOA Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
Seroneutralization	No	0	0
ELISA	No	325	594

Direct diagnostic tests		Nationally	Internationally
Cell Culture	yes	4	0
Real-time RT-PCR(rRT-PCR)	yes	344	914
Immunohistochemistry (IHC)	yes	13	0
Molecular characterization (RT-PCR and sequencing analysis)	yes	4	1

## TOR2: REFERENCE MATERIAL

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

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOA?H Members?

Yes

TYPE OF REAGENT AVAILABLE	RELATED DIAGNOSTIC TEST	PRODUCED/ PROVIDE	AMOUNT SUPPLIED NATIONALLY (ML, MG)	AMOUNT SUPPLIED INTERNATIONALLY (ML, MG)	NO. OF RECIPIENT WOA?H MEMBER COUNTRIES	COUNTRY OF RECIPIENTS
Live betanodavirus (coldwater strains)	RT-PCR rRT-PCR virus isolation	Stored	0 ml	2 ml	1	Europe
Live betanodavirus (reference reassortant strain)	RT-PCR rRT-PCR virus isolation	Stored	0 ml	1 ml	1	Europe
Live betanodavirus (reference strain)	RT-PCR rRT-PCR virus isolation	Stored	3 ml	0 ml	2	Europe
Live betanodavirus (reference strains)	RT-PCR rRT-PCR	Stored	0 ml	1 ml	1	Asia and Pacific
Inactivated betanodavirus (reference strains)	ELISA	Produced	0 ml	4 ml	1	Europe
Characterized Sea Bass serum	SN ELISA	Stored	0 ml	138 x 0,1 ml	1	Europe
SSN-1 cell	Virus isolation	Produced	0 ml	5 ml	1	Africa

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOA?H 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 WOA?H 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
SPAIN	2022-01-01	Real time PCR-genotyping	744	1
FRANCE	2022-01-01	Real time PCR-ELISA	698	0
THE NETHERLANDS	2022-04-01	Real time PCR	10	0
CROATIA	2022-03-01	Real time PCR	3	0
CYPRUS	2022-03-01	Real time PCR	5	0
ISRAEL	2022-09-01	Real time PCR	18	0
IRAN	2022-06-01	Real time PCR	9	0
MALTA	2022-11-01	Real time PCR-ELISA	21	0

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
SPAIN	Diagnosis and control of VER	Remote assistance and training
FRANCE	Diagnosis and control of VER	Analysis of samples and remote assistance
THE NETHERLANDS	Development of ELISA Assay	Provision of standard reagents and remote assistance
IRAN	Diagnosis and control of VER	Analysis of samples and remote assistance
CYPRUS	Diagnosis and control of VER	Analysis of samples and remote assistance
TUNISIA	Diagnosis and control of VER. External advisor for a project on VER. Assistance towards the accreditation of real time RT-PCR against betanodaviruses	Training, visit in loco, analysis of samples, provision of reagents and procedures
MALTA	Diagnosis and control of VER	Diagnostic support and remote assistance
UNITED STATES OF AMERICA	To write a paper on VER in blue marlin	Document writing
ISRAEL	Diagnosis and control of VER	Diagnostic support and remote assistance

## 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	<a href="http://www.vetbionet.eu/consortium/">www.vetbionet.eu/consortium/</a> 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.	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. <a href="https://pathogeltrap.eu/project/">https://pathogeltrap.eu/project/</a>	IRELAND ITALY POLAND SPAIN
AQUAE-STRENGHT	3 years	Strengthening capacity on aquatic animal health and epidemiological surveillance	Advisors: Norwegian Veterinary Institute - 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

## 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 repository of reassortant RGNNV/SJNNV strains from NNV outbreaks in sea bream; 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.

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:

4

1. Biasini, L., Berto, P., Abbadi, M., Buratin, A., Toson, M., Marsella, A., Toffan, A., & Pascoli, F. (2022). Pathogenicity of different betanodavirus RGNNV/SJNNV reassortant strains in european sea bass. *Pathogens* 1110.3390/pathogens11040458

2. Padrós, F., Caggiano, M., Toffan, A., Constenla, M., Zarza, C., & Ciulli, S. (2022). Integrated management strategies for viral nervous necrosis (VNN) disease control in marine fish farming in the mediterranean. *Pathogens* 1110.3390/pathogens11030330

3. Vázquez-Salgado, L., Pascoli, F., Marsella, A., Biasini, L., Buratin, A., Pretto, T., Abbadi, M., Melchiotti, E., Bandín, I., & Toffan, A. (2022). Role of rotifers in Betanodavirus transmission to European sea bass larvae. , 941. *Frontiers in Veterinary Science*, Frontiers03 August 2022 doi:https://doi.org/10.3389/fvets.2022.932327

Zrnica, S., Brnic, D., Panzarin, V., Abbadi, M., Lojic, I., Zupicic, I.G., & Oraic, D. (2022). Transmission pathways of the VNN introduced in Croatian marine aquaculture. *Pathogens* 1110.3390/pathogens11040418

b) International conferences:

2

1. Pascoli, F., Bacchin, G., Buratin, A., Grieco, F. & Toffan, A. (2022). Pilot study of behavioral analysis in European sea bass (*Dicentrarchus labrax*) infected with Betanodavirus. *Aquaculture Europe 2022 - Innovative Solutions in a Changing World*. 27-30/09/2022 Rimini, Italy

2. Vázquez-Salgado, L., Pascoli, F., Marsella, A., Biasini, L., Buratin, A., Pretto, T., Abbadi, M., Melchiotti, E., Bandín, I. & Toffan, A. (2022). NNV horizontal transmission to sea bass larvae through the live food. *XVI Congreso Nacional de Virología - SEV2022*, (p. 139). 6-9/09/2022, Malaga, Spain

c) National conferences:

3

1. Biasini, L., Vázquez-Salgado, L., Pascoli, F., Marsella, A., Buratin, A., Pretto, T., Abbadi, M., Melchiotti, E., Bandín, I. & Toffan, A. (2022). Ruolo dei rotiferi nella trasmissione di Betanodavirus in larve di spigola. *XXVI Convegno Nazionale S.I.P.I Società Italiana di Patologia Ittica*, Atti SIPI Messina 2022, (p. 22). 23-25/06/2022, Messina, Italy

2. Ciulli S., Caggiano M., Toffan A., Constenla M., Zarza C., Padrós F. (2022). Il controllo dell'encefalo-retinopatia virale: la necessità di una strategia di gestione integrata, *XXVI Convegno Nazionale S.I.P.I Società Italiana di Patologia Ittica*, Atti SIPI Messina 2022, (O6). 23-25/06/2022, Messina, Italy

3. Pascoli, F., Bacchin G., Buratin A., Grieco, F., Toffan A. (2022) Studio pilota di analisi comportamentale in spigole infette con

betanodavirus. , XXVI Convegno Nazionale S.I.P.I Società Italiana di Patologia Ittica, Atti SIPI Messina 2022, (O9). 23-25/06/2022, Messina, Italy

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

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*Invited speaker (1):*

Toffan, A. (2022) "Viral encephalopathy and retinopathy (VER)"

ECAAH Training Centres, online webinar 04/02/2022

<https://ecaah.org/training-centres/>

*Projects at National level (1):*

RC 13/22 VERTICAL – "Study on vertical transmission of immunity and VER virus infection in sea bream"

(the RL participates as principal investigator)

*Links (4):*

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 MEDAID:*

<http://www.izsvenezie.com/medaid-project-stand-up-mediterranean-fish-farming/>

EU Horizon 2020: MedAID (Mediterranean Aquaculture Integrated Development)

<http://www.medaaid-h2020.eu/>

*IZSVE's contribution to Pathogeltrap:*

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

<https://pathogeltrap.eu/>

## 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: 2

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	Tunisia	2

## 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	Accreditation certificate as Testing Laboratory	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 (5th Ed.).

## **TOR9: SCIENTIFIC MEETINGS**

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

No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOAHA?

No

## **TOR10: NETWORK WITH WOAHA REFERENCE LABORATORIES**

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

Not applicable (only WOAHA Reference Laboratory designated for the disease)

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

Not applicable (Only WOAHA Reference Laboratory designated for the disease)

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

Not applicable (Only WOAHA Reference Laboratory designated for the disease)

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

Not applicable (Only WOAHA 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 WOAH Reference Laboratories for the same pathogen?

Yes

Purpose for inter-laboratory test comparisons <sup>1</sup>	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Region(s) of participating WOAH Member Countries
4th Inter-laboratory Proficiency Test (VER-IPT) for the molecular detection of Betanodavirus	Organiser	25	Africa America Asia and Pacific Europe MiddleEast

## TOR12: EXPERT CONSULTANTS

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

Yes

KIND OF CONSULTANCY	Location	SUBJECT (FACULTATIVE)
External technical consultant on behalf of IAEA-FAO IAEA project TUN5032 "Establishing a National Certified Pipeline to Produce Aquaculture Vaccines by Irradiation » (AquaVac-ir, 2022–2026)	Tunisia	1) Provided an assessment of the current viral and molecular diagnostic capacity of the virology platform at the National Institute of Marine Sciences and Technologies in Tunis (INSTM); 2) Recommended improvements and 3) provided technical assistance to the Laboratory for Betanodavirus molecular diagnostic (Tunis), in order to apply for accreditation in compliance with ISO/IEC 17025:2017.

29. Additional comments regarding your report:

No