

OIE Reference Laboratory Reports Activities

Activities in 2021

This report has been submitted : 2022-01-21 15:04:43

Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Infection with (Bonamia exitiosa, B. ostreae)
Address of laboratory:	Laboratoire de Génétique Aquaculture et Pathologie de Mollusques Marins 17390 La Tremblade FRANCE
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Name (including Title) of Head of Laboratory (Responsible Official):	Dr Isabelle Arzul
Name (including Title and Position) of OIE Reference Expert:	Dr Isabelle Arzul (Cadre de recherche et responsable du laboratoire)
Which of the following defines your laboratory? Check all that apply:	Other: EPIC

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
0	Non	0	0
Direct diagnostic tests		Nationally	Internationally
Histologie	Oui	380	69
Cytologie	Oui	15	0
PCR conventionnelle	Oui	0	0
PCR en temps réel Multiplex 1	Non	70	5
PCR en temps réel Multiplex 2	Non	600	21
PCR en temps réel	Non	0	0
Hybridation in situ	Oui	0	1
Sequençage	Oui	0	1

**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
Lames histologiques	Histologie	0	0	10	1	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Blocs de paraffine	Histologie	0	0	3	1	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Lames cytologiques	Cytologie	0	0	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
Tissus fixés en éthanol	PCR, PCR en temps réel, séquençage	0	0	2	2	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Suspensions d'ADN génomique	PCR, PCR en temps réel, séquençage	0	1	1	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
Suspensions d'ADN plasmidique	PCR, PCR en temps réel	0	1	13	5	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East

Photos de lames histologiques	Histologie	0	0	2	1	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
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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?

No

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	Janvier	28	0
COTE D'IVOIRE	Février	32	0
MOROCCO	Août	0	24
UNITED KINGDOM	Octobre	1	0

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
THE NETHERLANDS	Demande d'information concernant les performances de la PCR multiplex en temps réel pour la détection de <i>Bonamia ostreae</i> et <i>B. exitiosa</i>	Envoi des données de performance de la PCR
IRELAND	Demande de conseil pour évaluer la qualité de l'ARN extrait à partir d'huître	Envoi de recommandation pour évaluer la qualité de l'ARN
SWEDEN	Demande d'information concernant les performances de la PCR multiplex en temps réel pour la détection de <i>Bonamia ostreae</i> et <i>B. exitiosa</i>	Envoi des données de performance de la PCR
ITALY	Demande d'aide pour la détection d'organismes pathogènes de mollusques en PCR	Envoi de protocoles pour la détection par PCR en temps réel d'organismes pathogènes de mollusques
UNITED KINGDOM	Demande d'aide pour la détection d'organismes pathogènes de mollusques en PCR	Envoi de protocoles pour la détection par PCR en temps réel d'organismes pathogènes de mollusques
ITALY	Demande d'avis sur la base d'observation de photos de lames histologiques	Par messagerie électronique: description des lésions et des organismes pathogènes éventuellement présents sur les photos
FRANCE	Demande d'aide pour la détection d'organismes pathogènes de palourdes en PCR	Envoi de recommandations pour la détection par PCR en temps réel d'organismes pathogènes de palourdes
THE NETHERLANDS	Demande d'avis sur la base d'observation de photos de lames histologiques	Par messagerie électronique: description des lésions et des organismes pathogènes éventuellement présents sur les photos

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
Etude des parasites de coques en Europe	3 ans	Etablir la distribution et la prévalence des principaux parasites affectant les coques <i>Cerastoderma edule</i> en Europe	Partenaires du projet européen Interreg Cockles http://www.cockles-project.eu/	SPAIN IRELAND PORTUGAL UNITED KINGDOM

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:

Dans le cadre des activités du Laboratoire de Référence de l'Union Européenne pour les maladies des mollusques, notre laboratoire collecte annuellement les données épidémiologiques concernant les maladies des mollusques à l'échelle européenne

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:

Dans le cadre des activités du Laboratoire de Référence de l'Union Européenne pour les maladies des mollusques, notre laboratoire collecte annuellement les données épidémiologiques concernant les maladies des mollusques à l'échelle européenne

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: 17

Trotter Andrew J., Vignier Julien, Wilson Teresa K., Douglas Marianne, Adams Serean L., King Nick, Cunningham Matthew P., Carter Chris G., Boudry Pierre, Petton Bruno, Dégremont Lionel, Smith Greg G., Pernet Fabrice (2021). Case study of vertical transmission of ostreid herpesvirus-1 in Pacific oysters and biosecurity management based on epidemiological data from French, New Zealand and Australian hatchery-propagated seed . *Aquaculture Research* , 52(8), 4012-4017 . <https://doi.org/10.1111/are.15219>

Petton Bruno, Destoumieux Garzon Delphine, Pernet Fabrice, Toulza Eve, de Lorgeril Julien, Degremont Lionel, Mitta Guillaume (2021). The Pacific Oyster Mortality Syndrome, a Polymicrobial and Multifactorial Disease: State of Knowledge and Future Directions . *Frontiers In Immunology* , 12, 630343 (10p.) . Publisher's official version : <https://doi.org/10.3389/fimmu.2021.630343> , Open Access version : <https://archimer.ifremer.fr/doc/00679/79158/>

Paillard Christine, Gueguen Yannick, Wegner K Mathias, Bass David, Pallavicini Alberto, Vezzulli Luigi, Arzul Isabelle (2022). Recent advances in bivalve-microbiota interactions for disease prevention in aquaculture . *Current Opinion in Biotechnology* , 73, 225-232 . <https://doi.org/10.1016/j.copbio.2021.07.026>

Fernández-Boo Sergio, Provot Clément, Lecadet Cyrielle, Stavrakakis Christophe, Papin Mathias, Chollet Bruno, Auvray Jean-François, Arzul Isabelle (2021). Inactivation of marine bivalve parasites using UV-C irradiation: Examples of *Perkinsus olseni* and *Bonamia ostreae* . *Aquaculture Reports* , 21, 100859 (10p.) . Publisher's official version : <https://doi.org/10.1016/j.aqrep.2021.100859> , Open Access version : <https://archimer.ifremer.fr/doc/00723/83457/>

Itoiz Sarah, Perennou Morgan, Mouronville Clara, Derelle Evelyne, Le Goïc Nelly, Bidault Adeline, de Montaudouin Xavier, Arzul Isabelle, Soudant Philippe, Chambouvet Aurélie (2021). Development of duplex TaqMan-based real-time PCR assay for the simultaneous detection of *Perkinsus olseni* and *P. chesapeaki* in host Manila clam tissue samples . *Journal Of Invertebrate Pathology* , 184, 107603 (12p.) . <https://doi.org/10.1016/j.jip.2021.107603>

Gustafson Lori, Arzul Isabelle, Burge Colleen A., Carnegie Ryan B., Caceres-Martinez Jorge, Creekmore Lynn, Dewey Bill, Elston Ralph, Friedman Caroline S., Hick Paul, Hudson Karen, Lupo Coralie, Rheault Bob, Spiegel Kevin, Vásquez-Yeomans Rebeca (2021). Optimizing surveillance for early disease detection: Expert guidance for Ostreid herpesvirus surveillance design and system sensitivity calculation . *Preventive Veterinary Medicine* , 194, 105419 (9p.) . <https://doi.org/10.1016/j.prevetmed.2021.105419>

Colsoùl Bérenger, Boudry Pierre, Pérez-parallé María Luz, Bratoš Cetinić Ana, Hugh-jones Tristan, Arzul Isabelle, Mérour Nicolas, Wegner Karl Mathias, Peter Corina, Merk Verena, Pogoda Bernadette (2021). Sustainable large-scale production of European flat oyster (*Ostrea edulis*) seed for ecological restoration and aquaculture: a review . *Reviews In Aquaculture* , 13(3), 1423-1468 . Publisher's official version : <https://doi.org/10.1111/raq.12529> , Open Access version : <https://archimer.ifremer.fr/doc/00678/79001/>

Arzul Isabelle, Canier Lydie, Morga Benjamin, Moussa Pouly Mirna, Toldra A, Pallavicini A (2021). Perspectives of diagnostic approaches for mollusc diseases . *European Association of Fish Pathologists Bulletin (EAFP Bulletin)* , 41(2), 50-58 . https://eafp.org/download/2021-volume41/issue_2/41-2-50-arzul.pdf

Moussa M., Cauvin E., Le Piouffle A., Lucas O., Bidault Adeline, Paillard Christine, Benoit F., Thuillier B., Treilles M., Travers Marie-Agnes, Garcia Celine (2021). A MALDI-TOF MS database for fast identification of *Vibrio* spp. potentially pathogenic to marine mollusks . *Applied Microbiology And Biotechnology* , 105(6), 2527-2539 . Publisher's official version : <https://doi.org/10.1007/s00253-021-11141-0> , Open Access version : <https://archimer.ifremer.fr/doc/00680/79224/>

Garcia Celine, Mesnil Aurelie, Tourbiez Delphine, Moussa Pouly Mirna, Dubreuil Christine, Gonçalves De Sa Amélie, Chollet Bruno, Godfrin Yoann, Dégremont Lionel, Serpin Delphine, Travers Marie-Agnes (2021). *Vibrio aestuarianus* subsp. *cardii* subsp. nov., pathogenic to the edible cockles *Cerastoderma edule* in France, and establishment of *Vibrio aestuarianus* subsp. *aestuarianus* subsp. nov. and *Vibrio aestuarianus* subsp. *francensis* subsp. nov. *International Journal Of Systematic And Evolutionary Microbiology* , 71(2), 004654 (10p.) . Publisher's official version : <https://doi.org/10.1099/ijsem.0.004654> , Open Access version : <https://archimer.ifremer.fr/doc/00677/78893/>

Prado-Alvarez Maria, García-Fernández Pablo, Faury Nicole, Azevedo Carlos, Morga Benjamin, Gestal Camino (2021). First detection of OsHV-1 in the cephalopod *Octopus vulgaris*. Is the octopus a dead-end for OsHV-1? *Journal Of Invertebrate Pathology* , 183, 107553 (13p.) . Publisher's official version : <https://doi.org/10.1016/j.jip.2021.107553> , Open Access version : <https://archimer.ifremer.fr/doc/00680/79201/>

Dégremont Lionel, Morga Benjamin, Maurouard Elise, Travers Marie-Agnes (2021). Susceptibility variation to the main pathogens of *Crassostrea gigas* at the larval, spat and juvenile stages using unselected and selected oysters to OsHV-1 and/or *V. aestuarianus* . *Journal Of Invertebrate Pathology* , 183, 107601 (10p.) . <https://doi.org/10.1016/j.jip.2021.107601>

Morga Benjamin, Jacquot Maude, Pelletier Camille, Chevignon Germain, Dégremont Lionel, Biétry Antoine, Pepin Jean-François, Heurtebise Serge, Escoubas Jean Michel, Bean Tim P., Rosani Umberto, Bai Chang-Ming, Renault Tristan, Lamy Jean-Baptiste (2021). Genomic Diversity of the Ostreid Herpesvirus Type 1 Across Time and Location and Among Host Species . *Frontiers In Microbiology* , 12, 711377 (13p.) . Publisher's official version : <https://doi.org/10.3389/fmicb.2021.711377> , Open Access version : <https://archimer.ifremer.fr/doc/00706/81762/>

Vincent Hubert Françoise, Wacrenier Candice, Morga Benjamin, Lozach Solen, Quenot Emmanuelle, Mege Mickael, Lecadet Cyrielle, Gourmelon Michele, Hervio-Heath Dominique, Le Guyader Soizick (2021). Passive Samplers, a Powerful Tool to Detect Viruses and Bacteria in Marine Coastal Areas . *Frontiers In Microbiology* , 12, 631174 (12p.) . Publisher's official version : <https://doi.org/10.3389/fmicb.2021.631174> , Open Access version : <https://archimer.ifremer.fr/doc/00682/79375/>

Leprêtre Maxime, Faury Nicole, Segarra Amelie, Claverol Stéphane, Degremont Lionel, Palos-Ladeiro Mélissa, Armengaud Jean, Renault Tristan, Morga Benjamin (2021). Comparative Proteomics of Ostreid Herpesvirus 1 and Pacific Oyster Interactions With Two Families Exhibiting Contrasted Susceptibility to Viral Infection . *Frontiers In Immunology* , 11, 621994 (16p.) . Publisher's official version : <https://doi.org/10.3389/fimmu.2020.621994> , Open Access version : <https://archimer.ifremer.fr/doc/00669/78075/>

Hammel Maurine, Simon Alexis, Arbiol Christine, Villalba Antonio, Burioli Erika Av, Pépin Jean-Francois, Lamy Jean-Baptiste, Benabdelmouna Abdellah, Bernard Ismael, Houssin Maryline, Charrière Guillaume, Destoumieux Garzon Delphine, Welch John J., Metzger Michael J, Bierne Nicolas Prevalence and polymorphism of a mussel transmissible cancer in Europe . *Molecular Ecology IN PRESS* . <https://doi.org/10.1111/mec.16052>

Haure Joel, François Cyrille, Degremont Lionel, Ledu Christophe, Maurouard Elise, Girardin Frederic, Benabdelmouna Abdellah (2021). Physiological comparisons of Pacific cupped oysters at different levels of ploidy and selection to OsHV-1 tolerance . *Aquaculture* , 544, 73711 (7p.) . Publisher's official version : <https://doi.org/10.1016/j.aquaculture.2021.73711> , Open Access version : <https://archimer.ifremer.fr/doc/00703/81496/>

b) International conferences: 3

Isabelle Arzul. Diversity of bivalve pathogens and risks of emergence in connection with climate change and the loss of marine biodiversity - Aquaculture Advisory Council-Working group Shellfish - 3 février 2021-02-04

Isabelle Arzul, Chloé Berland, Bruno Chollet, Céline Garcia, Coralie Lupo, Delphine Serpin, Mathilde Noyer, Cyrielle Lecadet, Pauline Person, Lionel Dégrement, Agnès Travers, Delphine Tourbiez, Aurélie Nadeau, Lydie Canier, Benjamin Morga, Nicole Faury, Mickael Mege, Yannick Guéguen. Geographic distribution of haplosporidium costale in France. Thursday 18 MARCH 2021- WORKSHOP on Haplosporidium parasites

Nicolas Mérou, Cyrielle Lecadet, Stéphane Pouvreau and Isabelle Arzul- Investigation on the environmental distribution of *Bonamia ostreae* and *Marteilia refringens*, two parasites of the flat oyster, *Ostrea edulis*. Tuesday 16 MARCH 2021- Annual Meeting of NRLs for Mollusc disease- On line meeting

c) National conferences: 1

Isabelle Arzul, Chloé Berland, Bruno Chollet, Céline Garcia et Coralie Lupo-Etude de la distribution spatiale d'haplosporidium costale en France- MARDI 9 MARS 2021-JOURNEE DES LABORATOIRES AGREES ET RECONNUS- On line

d) Other:

(Provide website address or link to appropriate information) 4

Rapport :

Pouvreau Stephane, Cochet Hélène, Fabien Aurélie, Arzul Isabelle, Lapegue Sylvie, Gachelin Sonia, Salaun Benoit (2021). Inventaire, diagnostic écologique et restauration des principaux bancs d'huitres plates en Bretagne : le projet FOREVER . Rapport final. Contrat FEAMP 17/2215675 . <https://doi.org/10.13155/79506>

Sites web:

OIE Reference Laboratory for marteiliosis and bonamiosis

EU Reference Laboratory for diseases of molluscs

<http://www.eurl-mollusc.eu/>

VIVALDI Project

<http://www.vivaldi-project.eu>

<https://www.facebook.com/vivaldiproject/>

@VivaldiEUProj

Video on the EU project VIVALDI

<https://image.ifremer.fr/data/00640/75216/#29871>

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: 1
 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
b	(Belgium, Canada Croatia, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Lithuania, Montenegro, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, The Netherlands, Turkey and United-Kingdom	75
c	Bulgarie	1
a	Belgique	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 9001 (Certification)	Certificat ISO 9001_2021.pdf
NF EN ISO/CEI 17025 (accréditation)	attestation accreditation 1-2160_17025.pdf
NF EN ISO/CEI 17043(accréditation)	Attestation 1-6907_17043.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Histologie-Cytologie	COFRAC
Organisation des essais inter-laboratoires en histo-cytologie	COFRAC

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?

No

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?

Not applicable (Only OIE Reference Lab. designated for disease)

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?

Not applicable (Only OIE Reference Lab. designated for disease)

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?

Not applicable (Only OIE Reference Lab. designated for disease)

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
Tester la compétence des laboratoires pour la détection de la bactérie <i>Vibrio aestuarianus</i> par PCR	16	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East
Tester la compétence des laboratoires pour la détection en histologie de certaines maladies des mollusques marins dont les infections à <i>Bonamia</i> sp.)	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

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)
Animation et participation à un groupe de travail	On Line May-June	ad hoc Group on Susceptibility of mollusc species to infection with OIE listed diseases
Animation et participation à un groupe de travail	On Line November-December	ad hoc Group on Susceptibility of mollusc species to infection with OIE listed diseases

25. Additional comments regarding your report:

Les conditions sanitaires en 2021 ont contribué à réduire le nombre d'analyses réalisées au laboratoire, le nombre de formations réalisées et de participations à des conférences en particulier internationales

