

OIE Reference Laboratory Reports Activities

Activities in 2020

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Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Infection with (<i>Bonamia exitiosa</i> , <i>B. ostreae</i>)
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):	Christian Béchemin
Name (including Title and Position) of OIE Reference Expert:	Dr Isabelle Arzul (Cadre de Recherche)
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	208	66
Cytologie	Oui	10	
PCR conventionnelle	Oui		5
PCR en temps réel Multiplex 1	Non	367	
PCR en temps réel Multiplex 2	Non	520	5
PCR en temps réel	Non	880	5

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	3	0	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
Lames cytologiques	Cytologie	0	0	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
Tissus fixés en éthanol	PCR, PCR en temps réel, séquençage	0	4	6	4	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Suspensions d'ADN génomique	PCR, PCR en temps réel	0	14	11	6	<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
Suspensions d'ADN plasmidique	PCR, PCR en temps réel	0	1	0	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?

Yes

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

No

Name of the new test or diagnostic method or vaccine developed	Description and References (Publication, website, etc.)
PCR en temps réel multiplex Taqman pour la détection de <i>Bonamia</i> sp. et <i>Marteilia refringens</i>	Canier Lydie, Dubreuil Christine, Noyer Mathilde, Serpin Delphine, Chollet Bruno, Garcia Celine, Arzul Isabelle (2020). A new multiplex real-time pcr assay to improve the diagnosis of shellfish regulated parasites of the genus <i>marteilia</i> and <i>bonamia</i> . Preventive Veterinary Medicine , 183, 105126 (8p.) . https://doi.org/10.1016/j.prevetmed.2020.105126

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
PAPUA NEW GUINEA	Janvier	10	0
CROATIA	Janvier	0	12
CROATIA	Janvier	0	16
UNITED KINGDOM	Février	1	0
IRELAND	Mars	17	0
NORWAY	Avril	0	8
NORWAY	Juillet	0	48

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
FRANCE	Demandes 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	Aide à la fixation des échantillons pour l'histologie	Envoi d'un protocole pour la fixation des tissus pour l'histologie
BELGIUM	Demande d'aide pour la détection de <i>Bonamia</i> sp. et <i>Marteilia refringens</i> en PCR	Envoi d'un protocole pour la détection par PCR en temps réel des parasites <i>Bonamia</i> sp. et <i>Marteilia refringens</i>
THE NETHERLANDS	Demande d'avis pour échantillonner des larves et jeunes huîtres pour la surveillance de <i>Bonamia ostreae</i>	Par messagerie électronique:conseils et recommandations pour la surveillance de <i>Bonamia ostreae</i>
BULGARIA	Demande d'aide pour le développement d'approches diagnostiques pour la surveillance des maladies des mollusques	Par messagerie électronique : échange sur les approches disponibles et préparation d'une SOP pour la préparation des appositions d'organes pour la détection des parasites des genres <i>Bonamia</i> et <i>Marteilia</i>
NORWAY	Demande d'assistance pour l'interprétation de résultats en PCR	Par messagerie électronique : échanges et conseils pour l'interprétation de résultats en PCR

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
Anthropogenic risk pathways for marine disease	3 mois	Evaluer les différentes voies d'introduction et d'établissement de maladies aquatiques	Cawthron Institute (NZ)	AUSTRALIA UNITED STATES OF AMERICA IRELAND NEW ZEALAND UNITED KINGDOM
expert elicitation on the value of passive surveillance for the detection of OshV-1	6 mois	Evaluer l'efficacité de la surveillance passive pour la détection d'organismes pathogènes de mollusques	United States Department of Agriculture (USDA)	AUSTRALIA UNITED STATES OF AMERICA MEXICO

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 synthétise et diffuse les principales informations concernant les maladies des mollusques marins en Europe

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: 10

Canier Lydie, Dubreuil Christine, Noyer Mathilde, Serpin Delphine, Chollet Bruno, Garcia Celine, Arzul Isabelle (2020). A new multiplex real-time pcr assay to improve the diagnosis of shellfish regulated parasites of the genus *martellia* and *bonamia*. Preventive Veterinary Medicine, 183, 105126.
<https://doi.org/10.1016/j.prevetmed.2020.105126>

Cano Irene, Ryder David, Webb Steve C., Jones Brian J., Brosnahan Cara L., Carrasco Noelia, Bodinier Barbara, Furones Dolors, Pretto Tobia, Carella Francesca, Chollet Bruno, Arzul Isabelle, Cheslett Deborah, Collins Evelyn, Lohrmann Karin B., Valdivia Ana L., Ward Georgia, Carballal María J., Villalba Antonio, Marigómez Ionan, Mortensen Stein, Christison Kevin, Kevin Wakeman C., Bustos Eduardo, Christie Lyndsay, Green Matthew, Feist Stephen W. (2020). Cosmopolitan Distribution of Endozoicomonas-Like Organisms and Other Intracellular Microcolonies of Bacteria Causing Infection in Marine Mollusks. *Frontiers In Microbiology*, 11, 577481. <https://doi.org/10.3389/fmicb.2020.577481>

Dégremont Lionel, Azéma Patrick, Maurouard Elise, Travers Marie-Agnes (2020). Enhancing resistance to *Vibrio aestuarianus* in *Crassostrea gigas* by selection. *Aquaculture*, 526, 735429 (10p.). <https://doi.org/10.1016/j.aquaculture.2020.735429>

Fernández-Boo Sergio, Gervais Ophelie, Prado-Alvarez Maria, Chollet Bruno, Claverol Stéphane, Lecadet Cyrielle, Dubreuil Christine, Arzul Isabelle (2020). Is pallial mucus involved in *Ostrea edulis* defenses against the parasite *Bonamia ostreae*? *Journal Of Invertebrate Pathology*, 169, 107259. <https://doi.org/10.1016/j.jip.2019.107259>

François Cyrille, Haure Joel, Billy Jean-Christophe, Renault Tristan (2020). Toward reference intervals for shellfish: An illustrative case of feeding and respiratory activities in the Pacific cupped oyster, *Crassostrea gigas*. *Veterinary Clinical Pathology*, 49(2), 345-353. <https://doi.org/10.1111/vcp.12853>

Friedman Carolyn S., Reece Kimberly S., Wippel Bryanda J.T., Agnew M. Victoria, Dégremont Lionel, Dhar Arun K., Kirkland Peter, Macintyre Alanna, Morga Benjamin, Robison Clara, Burge Colleen A. (2020). Unraveling concordant and varying responses of oyster species to *Ostreid Herpesvirus 1* variants. *Science Of The Total Environment*, 739, 139752 <https://doi.org/10.1016/j.scitotenv.2020.139752>

Burge Colleen A., Reece Kimberly S., Dhar Arun K., Kirkland Peter, Morga Benjamin, Dégremont Lionel, Fauray Nicole, Wippel Bryanda J. T., Macintyre Alanna, Friedman Carolyn S. (2020). First comparison of French and Australian OsHV-1 mu vars by bath exposure. *Diseases Of Aquatic Organisms*, 138, 137-144. <https://doi.org/10.3354/dao03452>

Lupo Coralie, Bougeard Stéphanie, Le Bihan Véronique, Blin Jean Louis, Allain Gwenhael, Azéma Patrick, Benoit Fabienne, Béchemin Christian, Bernard Ismaël, Blachier Philippe, Brieau Léa, Danion Morgane, Garcia Aurélie, Gervasoni Erika, Glize Philippe, Lainé Audrey, Lapègue Sylvie, Mablouké Cécile, Poirier Laurence, Raymond Jean Christophe, Treilles Michael, Chauvin Claire, Le Bouquin Sophie Mortality of marine mussels *Mytilus edulis* and *M. galloprovincialis*: systematic literature review of risk factors and recommendations for future research. *Reviews in Aquaculture*. <https://doi.org/10.1111/raq.12484>

Mérou Nicolas, Lecadet Cyrielle, Pouvreau Stephane, Arzul Isabelle (2020). An eDNA/eRNA-based approach to investigate the life cycle of non-cultivable shellfish micro-parasites: the case of *Bonamia ostreae*, a parasite of the European flat oyster *Ostrea edulis*. *Microbial Biotechnology*, 13(6), 1807-1818. <https://doi.org/10.1111/1751-7915.13617>

Picot Sandy, Fauray Nicole, Arzul Isabelle, Chollet Bruno, Renault Tristan, Morga Benjamin (2020). Identification of the autophagy pathway in a mollusk bivalve, *Crassostrea gigas*. *Autophagy*, 16(11), 2017-2035. <https://doi.org/10.1080/15548627.2020.1713643>

b) International conferences: 3

Arzul Isabelle (2020) Webinar on Main marine mollusc diseases- Webinars for Global Aquatic Veterinary Education- 9 octobre 2020- <https://www.wavma.org/WebCEPD>

Canier Lydie, Chollet Bruno, Noyer Mathilde, Serpin Delphine, Nadeau Aurelie, Garcia Celine, Arzul Isabelle (2020). EURL for mollusc diseases: 2019 activities & perspectives. 2020 Annual Meeting of NRLs for Mollusc diseases. 7th of July 2020 - online meeting.

Canier Lydie, Noyer Mathilde (2020). Inter Laboratory Comparison test 2019-ILC-01. Annual Meeting of NRLs for mollusc diseases. 17-18th March 2020, Nantes.

c) National conferences: 7

Canier Lydie, Noyer Mathilde, Serpin Delphine, Chollet Bruno, Rochard Vincent, Nadeau Aurelie, Garcia Celine, Arzul Isabelle (2020). PCRs en temps-réel pour la détection des agents infectieux réglementés des coquillages. Journée des laboratoires agréés et reconnus. 12 mars 2020, Nantes.

Canier Lydie, Lupo Coralie, Garcia Celine (2020). Bilan 2019 du réseau REPAMO. Journée des laboratoires agréés et reconnus. 12 mars 2020, Nantes.

Garcia Celine, Travers Marie-Agnes, Moussa Pouly Mirna, Tourbiez Delphine, Chollet Bruno, Serpin Delphine, Noyer Mathilde, Mesnil Aurelie, Berland Chloe, Rochard Vincent, Canier Lydie, Arzul Isabelle, Bonnefoy Gabriel, Schwerdtle Pascal, Faury Nicole, Lecadet Cyrielle, Mege Mickael, Morga Benjamin, Lupo Coralie (2020). Laboratoire National de Référence des maladies des mollusques marins. Bilan 2019. Journée des laboratoires agréés et reconnus. 12 mars 2020, Nantes.

Garcia Celine, Chollet Bruno, Serpin Delphine, Noyer Mathilde, Canier Lydie (2020). Comparaisons interlaboratoires. Bilan 2019, Perspectives 2020. Journée des laboratoires agréés et reconnus. 12 mars 2020, Nantes.

Lupo Coralie, Moreira Rebeca, Campbell Katrina, Christley Robert (2020). Prévention des maladies des mollusques marins : perceptions des acteurs de la filière à l'échelle européenne. Journée annuelle des laboratoires d'analyses diagnostiques agréés et reconnus pour les maladies des mollusques marins. 12 Mars 2020, Nantes.

Lupo Coralie, Travers Marie-Agnes, Degremont Lionel, Arzul Isabelle, Berland Chloe, Canier Lydie, Chollet Bruno, Serpin Delphine, Faury Nicole, Lecadet Cyrielle, Mege Mickael, Noyer Mathilde, Tourbiez Delphine, Garcia Celine (2020). Détection du parasite *Haplosporidium costale* en 2019 en France. Journée des laboratoires agréés et reconnus. 12 mars 2020, Nantes.

Moussa Pouly Mirna, Travers Marie-Agnes, Cauvin Elodie, Thuillier Benoit, Le Piouffle Anthony, Lucas Olivier, Treilles Michael, Garcia Celine (2020). Base de données MALDI-TOF MS pour l'identification rapide des *Vibrio* d'intérêt chez les mollusques marins. Journée des laboratoires agréés et reconnus. 12 mars 2020, Nantes.

d) Other:

(Provide website address or link to appropriate information) 3

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: 0
- b) Seminars: 2
- c) Hands-on training courses: 0
- d) Internships (>1 month): 0

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
b	18 pays européens	28 participants
b	Webinar for Global Aquatic Veterinary Education	100 participants

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)	37849 Ifremer certificat 2019 décembre.pdf
NF EN ISO/CEI 17025 (accréditation)	attestation accreditation 1-2160.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Histologie-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 en histologie de certaines maladies des mollusques marins dont les infections à <i>Bonamia</i> sp.)	26	<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

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	Paris-Janvier	ad hoc Group on Susceptibility of mollusc species to infection with OIE listed diseases
Animation et participation à un groupe de travail	On Line-Juin	ad hoc Group on Susceptibility of mollusc species to infection with OIE listed diseases
Animation et participation à un groupe de travail	On line-Novembre/Décembre	ad hoc Group on Susceptibility of mollusc species to infection with OIE listed diseases

25. Additional comments regarding your report:

Les conditions sanitaires en 2020 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