

## EVALUATION REPORT OF THE UNIT

BIOM - Biologie Intégrative des Organismes  
Marins

### UNDER THE SUPERVISION OF THE FOLLOWING ESTABLISHMENTS AND ORGANISMS:

Sorbonne Université

Centre national de la recherche scientifique -  
CNRS

---

**EVALUATION CAMPAIGN 2023-2024**  
GROUP D

Rapport publié le 08/03/2024



In the name of the expert committee :

Vianney Pichereau, chairman of the committee

For the Hcéres :

Stéphane Le Bouler, acting president

In accordance with articles R. 114-15 and R. 114-10 of the Research Code, the evaluation reports drawn up by the expert committees are signed by the chairmen of these committees and countersigned by the president of Hcéres.

To make the document easier to read, the names used in this report to designate functions, professions or responsibilities (expert, researcher, teacher-researcher, professor, lecturer, engineer, technician, director, doctoral student, etc.) are used in a generic sense and have a neutral value.

This report is the result of the unit's evaluation by the expert committee, the composition of which is specified below. The appreciations it contains are the expression of the independent and collegial deliberation of this committee. The numbers in this report are the certified exact data extracted from the deposited files by the supervising body on behalf of the unit.

## MEMBERS OF THE EXPERT COMMITTEE

<b>Chairperson:</b>	Mr Vianney Pichereau, Université de Bretagne Occidentale
	Ms Christine Braquart, CNRS, Poitiers (representative of CNU)
	Mr Frédéric Clota, Inrae, Palavas-les-Flots
<b>Experts:</b>	Mr Pedro Martinez, Universitat de Barcelona, Spain
	Ms Paola Oliveri, University College London, United Kingdom
	Ms Deborah Power, Universidade do Algarve, Portugal
	Ms Katja Wassmann, CNRS, Paris (representative of CoNRS)

## HCÉRES REPRESENTATIVE

Mr Serge Delrot

## REPRESENTATIVES OF SUPERVISING INSTITUTIONS AND BODIES

Mr Patrick Blader, CNRS  
Mr Stéphane Régnier, Sorbonne University

## CHARACTERISATION OF THE UNIT

- Name: Biologie Intégrative des Organismes Marins
- Acronym: BIOM
- Label and number: UMR7232
- Composition of the executive team: Mr Hector Escriva (director) and Mr Didier Peuze (administrator)

## SCIENTIFIC PANELS OF THE UNIT

SVE Sciences du vivant et environnement  
SVE2 Productions végétales et animales (agronomie), biologie végétale et animale, biotechnologie et ingénierie des biosystèmes

## THEMES OF THE UNIT

For the period under assessment, the BIOM research unit included six independent research teams, studying the integrative biology of marine organisms. All research topics share the originality of using unconventional marine model organisms for comparative investigations. During the evaluated period, various lines of research were developed in the six teams:

E1: Evolution and development of chordates

E2: Development and evolution in ascidians

E3: Development and evolution of vertebrates

E4: EcoEvoDevo

E5: Evolutionary and environmental genomics of phytoplankton

E6: Marine interactions, evolution, and adaptation

Recently, in mid 2022, the unit welcomed a seventh team dedicated to the "Regeneration, Development and Evolution of Cnidarians".

The unit also includes a shared bioinformatics service (BSBII, B(IOM)S(ervice)BI(o)-I(nformatique) available to all teams, as well as a "video tracking and aquariology service".

## HISTORIC AND GEOGRAPHICAL LOCATION OF THE UNIT

The unit "Biologie Intégrative des Organismes Marins" (BIOM) was established in January 2011 as the UMR 7232 CNRS (INSB) – Université Pierre et Marie Curie (UPMC, now integrated in Sorbonne Université). It is a Unité Mixte de Recherche (UMR, Joint Research Unit) between CNRS and Sorbonne Université, located in Banyuls-sur-Mer and is affiliated with the "Observatoire Océanologique de Banyuls" (OOB, FR3724 CNRS-Sorbonne U).

Mr. Hervé Moreau served as the director of UMR 7232 during the initial two contract periods, and Mr Hector Escriva has been the director since 2017.

## RESEARCH ENVIRONMENT OF THE UNIT

BIOM benefits from three research platforms within the research federation OOB: BIOPIC (microscopy and cytology), Bio2mar (Biodiversité et biotechnologies marines), and REMIMED (Réseau marin instrumenté en Méditerranée) for sea access. BIOM also shares 50% of its bioinformatics service (BSBII) with other laboratories in the federation.

Furthermore, the E4 team leads a cross-cutting research theme within OOB, focused on "Rhythms and cycles in Mediterranean marine environments." This theme promotes scientific collaboration and exchange among the four research units at the OOB (FR3724).

BIOM is also involved in collaborative projects related to the Earth Biogenome Project, such as ATLASEA (PIA4) and the Catalan Biogenome project.

BIOM teams have actively participated in international networks, including EMBRC-France (PIA1), EMBRC-ERIC (and recently AO-EMBRC, PIA3 Equipex+), Assemble+ (H2020 Grant No. 730984, where the unit was leading JRA3), Corbel (H2020 Grant No. 654248), ECOS-Sud Chile cooperation program (grant ECOS n°C19B03), and Tara Oceans (where two members of the unit serve as scientific coordinators). Another active network for BIOM is the recently established West Pacific network of Marine Biology.

## UNIT WORKFORCE: in physical persons at 31/12/2022

Catégories de personnel	Effectifs
Professeurs et assimilés	3
Maîtres de conférences et assimilés	4
Directeurs de recherche et assimilés	6
Chargés de recherche et assimilés	5
Personnels d'appui à la recherche	9
<b>Sous-total personnels permanents en activité</b>	<b>27</b>
Enseignants-chercheurs et chercheurs non permanents et assimilés	0
Personnels d'appui non permanents	15
Post-doctorants	1
Doctorants	7
<b>Sous-total personnels non permanents en activité</b>	<b>23</b>
<b>Total personnels</b>	<b>50</b>

DISTRIBUTION OF THE UNIT'S PERMANENTS BY EMPLOYER: in physical persons at 31/12/2022. Non-tutorship employers are grouped under the heading "others".

Nom de l'employeur	EC	C	PAR
CNRS	0	11	9
Sorbonne Université	7	0	0
<b>Total personnels</b>	<b>7</b>	<b>11</b>	<b>9</b>

## GLOBAL ASSESSMENT

The BIOM unit produces high-quality research in the field of evolution, development, and ecology of various marine organism models. The unit employs cutting-edge integrated approaches in biology, such as genomics, functional genomics and imaging.

During the period assessed, the BIOM unit consisted of six teams: five small teams with one to two permanent researchers (E1, 2, 3, 4, 6) and one larger team containing five permanent researchers (E5). Both teams E5 and E6 will leave the unit for the next contract, and in late 2022 a new team (composed of 2 CNRS researchers) joined the unit for the next contract. In terms of scientific themes, the remodeling of the unit structure will result in a refocusing on Evo/Devo questions.

The committee considered the scientific objectives of the unit to be appropriate but noted the absence of a scientific strategy at the unit level. The emphasis has been on promoting the complete independence of researchers and teams, at the expense of unity. No effort has been made to bring together researchers and personnel from different teams, and the lack of a laboratory council or any collective approach has kept teams isolated from each other, as shown by the almost complete absence of joint publications.

The BIOM unit had an overall very good scientific productivity during the period under consideration, with many excellent publications which they coordinated in top international journals (Nature, Science, Nature Comm, Nat Ecol Evol, Nat Microbiol, Proc Nat Acad Sci USA, Cell Rep.,.) and an average publication rate of approximately 2.5 articles per year per full-time researcher. However, most of the publications resulted from large consortia, and less than half of the articles were signed as first, last, or corresponding authors by BIOM members. Furthermore, only four articles (3%) were common between at least two teams in the unit, indicating a very low to almost absent level of scientific interaction within the unit. The committee sees significant room for improvement in this aspect.

The attractiveness of the BIOM unit is good, given the high level of external collaborations presented by the teams and their involvement in several national and international networks. However, the unit is less efficient in attracting students or young researchers, and this is not only due to the geographic isolation of Banyuls-sur-Mer far from big cities and universities. Indeed, this attractiveness issue did not affect team 5 during the last contract (3 new CR CNRS recruited + 1 lecturer gained through mobility) nor the team 4 (with the recruitment of 1 MCF).

The unit was very successful in competitive calls for proposals, especially at the national level (ANR in particular). This has allowed all the unit's teams, except for team 6, which lagged behind in this aspect during the reference period, to have a good level of financial resources. The committee also noted a good level of access to equipment, especially to shared platforms of the OOB research federation.

In conclusion, the committee judged the overall activity of BIOM to be globally good, with significant heterogeneity between the teams. BIOM is currently in a challenging situation, with the notable departure of team 5, which contributed to many of the positive aspects. The committee hopes that the BIOM unit will learn from this situation and take the necessary measures in terms of structuring and functioning to ensure its long-term sustainability.

## DETAILED EVALUATION OF THE UNIT

### A - CONSIDERATION OF THE RECOMMENDATIONS IN THE PREVIOUS REPORT

The previous committee made the following recommendations:

*- Increase the interactions between teams and the size of the teams.*

Regarding the interaction between teams, the report mentions that interactions between teams 1 to 4 have continued to develop, particularly through two ANR projects (VentralPNS gathering teams E1, E2, E3, and MESOLAMPHIX gathering teams E1 and E3). This is not really obvious looking at the low number of co-publications between the teams (only 4 inter-team publications during the period) and based on the contents of the report, very little was done to foster such interactions.

Beyond the question of interactions between teams, there was the issue of team size. In this regard, the management firmly defended the organization in small teams: "why change a way of working that is productive and works?"

As a matter of fact, the only team that expanded in size was Team 5 GENOPHY, notably with 3 CNRS researcher recruitments, resulting in a team of 7 permanent researchers at the end of the contract, while the other 5 teams have 1 or 2 permanent researchers each. This posed problems because the governance and functioning of the unit did not adapt to this new situation, leading to the departure of Team 5 from BIOM for the next contract. Furthermore, Team 6 (INTERMED) will also leave the unit for the next contract, but for different reasons (lack of success in getting funding through competitive calls).

*- Improve the regular updating of the website of the unit by the teams.*

The unit's direction argues that this is a recurring issue, and that the maintenance of a website should fall under the responsibility of the federation's IT service. The proposed solution, ie. to give this role to the "recently" (2019) created bioinformatics service BSBII (which has many other roles), has not solved this issue. To solve the issue the direction indicated that the task will soon be performed by an external company.

*- The effort to attract a new team in Evo/devo or Eco/evo/devo should be continued. The committee recommended the creation of a SAB, which is important for the recruitment of new external teams but also for the creation of internal teams.*

The unit did not create a Strategic Advisory Board (SAB). However, the unit's direction is pleased with the recruitment of a new small team (two researchers) specialized in "regeneration, development, and evolution of cnidarians", thus strengthening the Evo-Devo capabilities of the unit.

### B - EVALUATION AREAS

Considering the references defined in the unit's evaluation guidelines, the committee ensures that a distinction is made on the outstanding elements for strengths or weaknesses. Each point is documented by observable facts including the elements from the portfolio. The committee assesses if the unit's results are consistent with its activity profile.

#### EVALUATION AREA 1: PROFILE, RESOURCES AND ORGANISATION OF THE UNIT

##### Assessment on the scientific objectives of the unit

The unit's scientific objectives are fair. The teams address important scientific themes, and they mostly developed an appropriate strategy to meet their objectives. However, the unit globally lacks a scientific vision, nor has it an integrated strategy to link the activities of the various teams. Nor is there a prospective vision that could help steer the unit towards a more favorable trajectory (scientifically, but also in terms of attractiveness, human resources, space allocation, etc.).

### Assessment on the unit's resources

The financial resources available are good. Core funding (without the salaries) is low (6%) but the teams were quite successful in raising project funding, especially from ANR (10 projects) and from H2020 (3 Marie Curie grants for E5). The exception was Team 6, which failed to raise any funding, but was helped by the unit for the duration of the contract. The scientists have the equipment they need, and access to high-quality platforms managed by the OOB Research Federation. Additionally, the space allocated is adequately proportioned to the unit's size.

### Assessment on the functioning of the unit

The functioning of the unit is good. While there have been some positive aspects in the reporting period, particularly in terms of human resources with numerous promotions, the overall functioning of the unit clearly needs improvement. Currently, decisions are made within a bureau that includes the director and the team leaders, but the unit lacks a laboratory council that would enable a balanced representation of teams and of the different staff categories in decision-making.

#### *1 / The unit has set itself relevant scientific objectives.*

#### Strengths and possibilities linked to the context

Understanding the ecology, development and evolution of marine organisms is a wide and interesting topic, crucial to address the current challenges related to biodiversity, with possible applications and relevance for the environment, pharmacology, nutraceuticals, and others. The tools available for the unit within the OOB provides a very favorable environment.

#### Weaknesses and risks linked to the context

BIOM does not have a scientific strategy, except the will to publish in high profile journals. One might think that this is not such a bad strategy, given that teams do manage to publish in high level international journals. However, the chaotic situation observed by the committee, namely a unit where researchers have few scientific interactions, no brainstorming to engage in the identification of collective and ambitious goals built on their excellent expertise, and the departure of two teams (representing almost half of the permanent researchers in the unit), is clearly related to this lack of scientific objectives/strategy and cohesion. The real skills, expertise, and tools available in the unit could be better exploited.

The direction advocates a simple organization in which the unit's scientific project is the sum of the individual projects of its teams. The self-evaluation report repeatedly puts emphasis on team independence. There are few efforts to promote exchange, sharing resources or expertise, or to foster a sense of community within the unit. Little has been done so far in that respect, and there are no plans for change (as seen in responses to the previous evaluation).

The absence of a strategy to make the research unit "more than the sum of its parts" restricts the unit's potential for growth, both in terms of organizational and scientific development. It inherently limits the opportunities for internal collaborations, knowledge sharing, and exchange of skills and concepts.

Another risk is that the absence of a collective scientific vision may lead individuals to feel uncomfortable in the unit. This may not be easily visible but can negatively impact the well-being of individuals and, ultimately, the scientific activity of the entire unit. The departure of teams T5 and T6 is at least partly connected to these issues.



## *2/ The unit has resources that are suited to its activity profile and research environment and mobilises them.*

### Strengths and possibilities linked to the context

Despite the direction's policy on team independence, there is still a policy of resource sharing within the unit, enabling 1) support of teams lacking resources, 2) joint purchase of certain consumables, and 3) collective purchase of large equipment.

The available resources for the unit are adequate as all teams, except team 6, have successfully secured project funding, mainly from participation in 10 ANR projects : E1, CHORELAND, NEUCECHO, MESOLAMPPIX as leader and VentralPNS, OXOMAR as participants; E2: VentralPNS as coordinator , E3: 3 ANRs as partner (AsymmetricBrain, VentralPNS, Mesolampix); E4: MANINI and SENSO as leader, and Oxomar as participant; E5: 2 ANR as leader (AlgalVir, Elvira). The unit has provided financial support to Team 6 throughout the contract duration (10 k€ per year). Some teams also secured some funds from European calls, ie. three MSCA grants for E5, and participation in the H2020 projects Assemble+ (E1+E2) and Corbel (E1), and in the ITN Singek (E5). They also participated in the PIA programs AtlaSEA and EMBRC-France, and obtained some projects from CNRS, OFB, Sorbonne Université. The unit has all the necessary equipment for its research activities. In addition to accessing the OOB federation platforms (BIOPIC, Bio2mar, REMIMED), the unit acquired shared equipment, including a centrifuge rotor, gel imaging system, luminometer, vibratome, Microscopy Image Analysis Software (Imaris), Cytoflex Laser, Axioscope (microscope), cell incubator, Biological Safety Cabinet (BSC), Tucsen camera for a binocular microscope. They also contributed to the purchase of an automated microscope for BIOPIC.

### Weaknesses and risks linked to the context

The most sensitive resource for the unit is lab space. Currently, except team E5 occupying 120 m<sup>2</sup>, each other team occupies an equivalent space consisting of a laboratory of around 30 m<sup>2</sup> and an office space (approximately 15 m<sup>2</sup>). Although the overall space seems well-proportioned for the size of the unit, the main issue seems to result from its distribution. This issue is particularly prevalent in the context of the departure of Teams 5 and 6 (and the migration with them of their current laboratory space), and the unit considers it as a key limitation for attracting talent for its future development during the upcoming contract.

From the table presented (contracts and valorisation, excel file), the number of ANR projects coordinated by the unit is very low: 1! This is extremely misleading for the committee, since a deeper search on the ANR site yielded a significantly higher number of coordinations.

## *3/ The unit's practices comply with the rules and directives laid down by its supervisory bodies in terms of human resources management, safety, environment, ethical protocols and protection of data and scientific heritage.*

### Strengths and possibilities linked to the context

The overall organization of the unit has yielded positive results in terms of human resource management, as eight employees were promoted during the last contract, including five technical staff. Regarding human resources, there were significant changes with the welcoming of nine new people (largely compensating for departures), which is not common nowadays in the French context.

Concerning health and safety matters, BIOM has a prevention assistant who fulfills their task efficiently. New employees receive specific training and are provided with a "welcome booklet". The prevention assistant also updates the "document unique" and regularly checks the safety of equipment posing potential risks. Finally, another positive aspect is the recent creation of SBEA to comply with regulations on animal welfare.

### Weaknesses and risks linked to the context

The main organizational issue for BIOM lies in the absence of a "laboratory council". Decisions are made by a "bureau" composed of the unit director and the team leaders. By fact, the composition of this bureau does not reflect the relative size of the teams. Furthermore, interviews with the different categories of staff suggested that it does not consult or inform efficiently enough other categories of personnel (support staff, post docs and Ph.Ds). The primary risk is that decisions may not be accepted, understood, or communicated efficiently enough, potentially leading to situations of misunderstanding among the BIOM staff.

Another aspect mentioned by the staff is the possibility for the BIOM's staff to attend external training. Indeed, while some training about regulatory issues (e.g. safety and security, first aid at work, etc.) are organized on-site, the outlying geographical location of Banyuls poses a challenge for mobility when scientific training is conducted in a distant site.

## EVALUATION AREA 2: ATTRACTIVENESS

### Assessment on the attractiveness of the unit

The attractiveness of BIOM was globally considered as good. The scientific activity is well recognized and visible at both national and international levels, enabling the teams to establish numerous external collaborations and raise sufficient research funds. However, it appears very challenging to attract students, Ph.D. candidates, postdocs, or researchers to the unit. This is likely due in part to the outlying geographical location of Banyuls but most probably stems in part from the absence of a dedicated strategy related to the webpage and the presence in social media.

- 1/ The unit has an attractive scientific reputation and is part of the European research area.*
- 2/ The unit is attractive because for the quality of its staff support policy.*
- 3/ The unit is attractive through its success in competitive calls for projects.*
- 4/ The unit is attractive for the quality of its major equipment and technical skills.*

### Strengths and possibilities linked to the context for the four references above

The unique scientific positioning of the BIOM unit, which focuses on characterizing understudied marine biological models and shows an excellent scientific production, provides an undeniable visibility and attractiveness to the unit. This attractiveness is evident when analyzing the publications, as most of them involve external - mainly international - collaborators. The unit's attractiveness is also reflected in the active participation of its members in numerous national and international networks such as e.g. Tara Ocean, EMBRC-ERIC, or the West Pacific Network of Marine Biology.

Attractiveness is also illustrated by the success in competitive funding calls, such as ANR (10 in total, 8 coordinated by BIOM (CHORELAND, NEUCECHO, MESOLAMPPIX, VentralPNS, MANINI, SENSO, AlgalVir, Elvira)), as well as in European projects (e.g. H2020 projects Assemble+ on functional genomics of marine organisms and Corbel dedicated to building Coordinated Research Infrastructures, and the ITN SINGEK on Single cell genomics of eukaryotes), and in PIA (AtlaSEA, EMBRC France), in calls from CNRS, OFB, local authorities, or Sorbonne University.

The unit members have also organized or co-organized numerous conferences, symposia, and workshops. Team 5 hosted three international visiting professors during the period.

Finally, certain members of the unit serve as editors for high-quality international journals, such as Genome Biol. Evol., and have acted as guest editors for special issues of journals like Microb. Environ., Genes, Front. Plant. Sci.

### Weaknesses and risks linked to the context for the four references above

Despite the successes mentioned earlier, attractiveness is generally considered as a significant challenge by the unit itself. This is primarily due to the difficulty faced by teams in attracting students and by the unit in attracting new researchers. For example, regarding attractiveness to students, the BIOM unit hosted 19 PhD students (12 thesis submitted) and 10 postdocs, including three MSCA Horizon Europe researchers, and many graduate students from various national and international universities. These numbers are low, as compared to the 18 researchers HDR in the unit.

One reason given by the unit revolves around the geographically remote location of Banyuls-sur-Mer and the distance from major universities, notably its parent university Sorbonne U located in Paris. Another reason might

be the Covid 19 pandemics, during the period 2020-21. But the committee thinks that weaknesses in external communication, particularly the inadequacy of the unit's website, likely play a crucial role. This point should be fixed quickly as the unit's website is currently being redesigned by an external company, provided that the website is then updated regularly by the teams and the unit. Another potentially significant factor is the absence of a strategy to enhance the visibility of its scientific activities, and the lack of an integrated unit strategy to improve its overall attractiveness.

## EVALUATION AREA 3: SCIENTIFIC PRODUCTION

### Assessment on the scientific production of the unit

The scientific production is overall very good, both quantitatively and qualitatively. Beyond bibliometric indicators, all teams have managed to produce particularly innovative results in their fields of expertise. Most of the high impact papers are produced with external collaboration. Internal collaborations (publications between teams) are very few.

- 1/ *The scientific production of the unit meets quality criteria.*
- 2/ *The unit's scientific production is proportionate to its research potential and properly shared out between its personnel.*
- 3/ *The scientific production of the unit complies with the principles of research integrity, ethics and open science. It complies with the directives applicable in this field.*

Strengths and possibilities linked to the context for the three references above

The UMR BIOM has produced a very high-quality research activity during the reference period. The overall production is very good.

The three teams (E1, 2, 3) focusing on the development and evolution of marine organisms have made major advances in their areas of expertise and on their original models (all belonging to chordates). Team 4, whose activity is increasingly focusing on the ecology of marine organisms (rather than Evo/devo), shows the best quantitative track record of publications. Team 5 also produced excellent advances on phytoplankton genomics and viruses, with many outstanding publications linked to their involvement in the Tara Ocean project.

From a quantitative perspective, the unit published 176 papers, representing a rate of 2.6 publications/year/ Full-Time Scientist (based on 16 FTS, and considering only the time actually spent in the unit during the period under assessment).

From a qualitative perspective, the unit has published articles in top international journals such as Nature, Nat. Ecol. Evol., Nat. Comm., Nat. Microbiol., Science, Cell, BMC Biol., Sci. Reps. *eLife*, as well as in high-level specialized international journals such as Mol. Biol. Evol., PLoS Genet., Genome Biol., Front. Cell Dev. Biol., and others. However, most of the high-impact publications are produced by large collaborative networks, each BIOM team having its own network.

The proportion of articles in which a member of BIOM is either the first, last, or corresponding author is 47%. This may reflect the high level of external collaborations and participation in large international networks, with the most active being the Tara Ocean project (T5).

The BIOM unit adheres to the rules established by its *tutela* bodies, CNRS and SU, in terms of scientific integrity. The committee did not identify any issues in this regard. All research personnel document their experiments in a CNRS special notebook for traceability, and all published data are deposited and made accessible in public repositories.

In addition, BIOM benefits from the recent creation of the SBEA within the Research Federation OOB. Several BIOM members are involved in SBEA. BIOM is also referenced for APAFIS.

## Weaknesses and risks linked to the context for the three references above

Beyond its overall quality, the scientific output varies significantly among teams, both quantitatively and qualitatively. For instance, the calculated rate of publication/year/FTS was 0.58 for Team 2 and 5.54 for Team 4. This ratio reflects the overall productivity (7 publications in the period for T2, compared to 43 for T4) but is obviously heavily influenced by the very small size of the teams (2 and 1 FTS for T2 and T4, respectively, at the end of the contract period). In fact, this is not the average activity of each team that is reflected here but that of a very limited number of researchers. Additionally, there was a significant turnover of human resources in some teams, which strongly impacted productivity (departures from Team 4, recent arrivals for Team 5).

Regarding the open science policy, the unit encourages the use of open-access journals and, when they are not used, encourages payment of the necessary fees to make the articles publicly accessible. Furthermore, every publication produced by BIOM's members should be deposited in the public repository HAL. The publication list provided to the committee, generated from the HAL database indicated that deposition of publications in HAL must be significantly improved.

Finally, while the various categories of personnel, especially students and technical staff, are associated with publications, the analysis of production showed almost no joint publications between teams. Indeed, only 4 inter-team publications were identified (1 between Teams 3/4/6, 2 between Teams 5/6, and 1 between Teams 4/5), which is exceptionally low (only 3% of the UMR's activity) and a major weakness, especially for a unit comprising so many teams. This suggests an almost total lack of interaction and sharing between teams during the period under assessment. It might also be expected that many external collaborations, should increase internal ones.

## EVALUATION AREA 4: CONTRIBUTION OF RESEARCH ACTIVITIES TO SOCIETY

### Assessment on the inclusion of the unit's research in society

The contribution of BIOM's research activities to society was good. Some members of the laboratory engaged in communication efforts targeting a broad audience and participated in local or international initiatives. However, BIOM currently undertakes minimal initiatives to translate its research into socio-economic impact through valorization activities, although it would be possible.

- 1/ *The unit stands out for the quality and the amount of its interactions with the non-academic world.*
- 2/ *The unit develops products for the cultural, economic and social world.*
- 3/ *The unit shares its knowledge with the general public and takes part in debates in society.*

## Strengths and possibilities linked to the context for the three references above

The research themes developed by BIOM, whether related to the development, evolution, or ecology of marine organisms, naturally align with societal challenges and issues concerning biodiversity in the face of climate change. Members of BIOM actively engage in disseminating knowledge to a large public, which is good. At the local level (in Banyuls), several team members were involved in organizing and hosting the annual event "La Science en Fête" (coordinated for the federation by a team 1 member). They also contributed to the dissemination of research through conferences organized by the research federation. These conferences were coordinated by the association "Les Amis du Laboratoire Arago", chaired by one of the emeritus DR, with two members (from T1 and T6) of BIOM participating in its advisory board. BIOM members were also involved in the Biodiversarium, open to the general public.

At the national level, another emeritus professor was highly active in explaining issues related to the evolution of marine biodiversity. Finally, at an international level, Team 5 was engaged in events related to the Tara Ocean project.

## Weaknesses and risks linked to the context for the three references above

Regarding the dissemination of science to a wider audience, BIOM's involvement was somewhat fragile as there was little coordination at the unit level.

The unit does not develop any product for the socio-economic world. BIOM takes pride in conducting exclusively basic research and does not actively seek to develop valorization towards the socio-economic sphere. Their themes do not clearly align with issues related to biotechnology, but this is an area that could be explored to create new opportunities.

## ANALYSIS OF THE UNIT'S TRAJECTORY

The BIOM unit, composed of seven teams at the time of the evaluation, is losing two teams (E5 and E6) and will therefore, in the next contract, consist of 5 teams. With the departure of Team 5, nearly half of the BIOM personnel and a highly significant and productive portion of its research activity will be lost.

With a thematic focus almost fully dedicated to Evo-Devo and only five small teams, one might think that the previous functioning could now be adapted to the situation and that the unit could be tempted to make no changes. The committee thinks that this is a short-term vision that will inevitably lead to a similar outcome to the current situation. Indeed, new recruitments need to be considered, and a strategy to enhance existing themes is likely to be more successful than relying solely on creating new teams.

Without a unit-wide scientific strategy, this could potentially lead to a situation like what happened with Team 5. Furthermore, with only 1 or 2 permanent researchers in each team, the risk of a team failing to attract grant funding is high (as happened to Team 6). Finally, the unique situation of Team 4, the only team in the unit not focusing on Evo-Devo, also needs consideration.

It is therefore necessary for BIOM to define a vision for the unit's scientific future through a collective approach, necessarily involving the development of a scientific strategy and making appropriate organizational changes.

A necessary and urgent organizational change is the implementation of a laboratory council, even if not mandated by the governing bodies for such a small unit. This council will bring together all teams and the various categories of personnel to initiate a collective scientific vision and strategy.

## RECOMMENDATIONS TO THE UNIT

### *Recommendations regarding the Evaluation Area 1: Profile, Resources and Organisation of the Unit*

The governance of BIOM operates through a management committee ('bureau') composed of the Unit Director and team leaders. The previous evaluation committee requested the establishment of a laboratory council, but this has not been implemented. Although the unit's supervisory bodies do not mandate the formation of a laboratory council for a small-sized unit like BIOM, the evaluation committee reiterates this request as it believes that this structure is necessary to ensure a balanced representation of all support personnel, PhD and postdocs, and of teams in the laboratory's decision-making processes.

This council should analyze collectively what led to the departure of teams 5 and 6, and assess the changes needed at the unit level (in its functioning and possibly its structure) to ensure the long-term viability of the unit. The absence of an integrated reflection and scientific strategy at the unit level poses a major problem in defining what a research unit is. It is crucial that teams and personnel align with a common scientific vision and a collective strategy to benefit from full synergy at various levels (personnel, funding, equipment, visibility, attractiveness). It is necessary to establish such a strategy through a collective brainstorming process. This scientific strategy should lead to a prospective vision that will refine the future trajectory of the unit. This strategy and vision will guide discussions and decisions of the future laboratory council, particularly on aspects related to:

- The collective life of the unit,
- Policies to enhance attractiveness to students and researchers,
- Team collaborations, remodeling, creation,
- Acquisition of new equipment,
- Organization of laboratory spaces,
- ...

Among the important issues to be addressed, the fostering of a collective life within the unit is essential. Solutions to the attractiveness problems and perhaps structural reorganization, as well as a reorganization of laboratory space utilization, can emerge from addressing this question, centered around a common scientific project.

### *Recommendations regarding the Evaluation Area 2: Attractiveness*

The BIOM unit is aware of its lack of attractiveness to students and researchers. Geographical remoteness likely plays a role but is certainly not the only significant factor. The completion of an appealing website for the unit is crucial. Additionally, the unit should consider implementing a strategy to attract candidates for lecturers and CNRS research positions. The unit should be more active in their search for European funding, Marie Curie grants and project coordination.

### *Recommendations regarding Evaluation Area 3: Scientific Production*

The BIOM's scientific production has been deemed very good. However, despite teams being capable of substantial collaborative activity outside the unit, the committee observed a very low number of inter-team publications. This aligns with the apparent lack of collective life within the UMR and this should be significantly improved.

### *Recommendations regarding Evaluation Area 4: Contribution of Research Activities to Society*

BIOM scientists were involved in initiatives such as the "Fête de la Science" during the last contract, which is a positive aspect and should continue.

However, the committee noted a very low interest in establishing connections with the socio-economic sector, despite BIOM's research being relevant to significant societal challenges related to biodiversity in the face of global change. This should be a major point to be considered in designing the scientific strategy of the Unit requested above, which will likely identify pertinent questions of interest to engage with societal stakeholders responsible for these issues, and potentially even with industry.

## TEAM-BY-TEAM OR THEME ASSESSMENT

**Team 1:** Evolution and Development of Chordates  
 Name of the supervisors: Mr Hector Escriva and Ms Stéphanie Bertrand

### THEMES OF THE TEAM

The team uses amphioxus to trace the origin of vertebrate morphological and developmental novelties. A major aim of the team is to understand the evolution of the neural and mesodermal systems.

### CONSIDERATION OF THE RECOMMENDATIONS OF THE PREVIOUS REPORT

In the previous report, the recommendations for this team were of two types: scientific (the strengthening their socio-economic impact and the student's recruitment policy) and organizational (e.g. reinforce the soft skills training of all team members). While they fulfilled the scientific recommendations, no improvements were observed in the recruitment of junior research personnel.

### WORKFORCE OF THE TEAM: in physical persons at 31/12/2022

Catégories de personnel	Effectifs
Professeurs et assimilés	0
Maîtres de conférences et assimilés	1
Directeurs de recherche et assimilés	1
Chargés de recherche et assimilés	0
Personnels d'appui à la recherche	1
<b>Sous-total personnels permanents en activité</b>	<b>3</b>
Enseignants-chercheurs et chercheurs non permanents et assimilés	0
Personnels d'appui non permanents	0
Post-doctorants	0
Doctorants	1
<b>Sous-total personnels non permanents en activité</b>	<b>1</b>
<b>Total personnels</b>	<b>4</b>

### EVALUATION

#### Overall assessment of the team

The overall team's performance has been rated as very good. The team used a wide range of technologies to understand how the regulatory genome shapes different tissues in Amphioxus. They actively participated in genomic and transcriptomic analysis of this species, becoming the world eiders the use of cephalochordates. The local access to the animals, the development of working tools and the numerous collaborations established abroad ensured a continuous production of articles of the highest quality. Furthermore, they are involved in teaching activities (more than 200 h per year) and in dissemination of science to the public and high schools. No interaction with the industry was indicated.

#### Strengths and possibilities linked to the context

The group has been devoted to the study of cephalochordates (amphioxus) for, at least, a couple of decades and are, nowadays, the undisputed leaders in the use of this group of animals in EvoDevo (with 25 articles of



which 44% are signed as first/corresponding/last authors). The participation in international networks such as the Amphioxus genome project and the Franco-Chilean collaborative project ECOS-Sud allowed them to decipher the genome of this animal and the in-depth study of their regulatory profiles (using modern technologies such as ATAC-seq, etc.).

Being pioneers in the use of amphioxus, and a very ambitious team, has allowed them, over the years, to produce papers of the highest quality (27 articles; among them some in influential journals such as: Nature, Nature Ecology and Evolution, Science Advances, PLOS Genetics, PNAS where they are leaders). Other publications such as reviews, editorials and book chapters are particularly relevant since they bring the attention of the EvoDevo community to the advantages of using Amphioxus for understanding chordate or vertebrate novelties, plus describing the methodologies necessary to the establishment of this biological model in the laboratory. The quality of the research was acknowledged through an IUF position (junior, then senior) to the lecturer who is a co-team leader. Major achievements consist in the incorporation of many new tools (e.g. Hybridization Chain Reaction in situ (HCR), genome sequencing or CRISPR, developed in different systems to the study of amphioxus development. Having local access to the species (*Branchiostoma lanceolatum*) utilized in the laboratory ensures their leadership in the field, which is sustained through the regular visit of researchers working in different aspects of amphioxus biology. The group has been funded through ANR Grants, in some of them as leaders (e.g. MESOLAMPHIX, NEUCECHO or CHORELAND), in others as partners (ventralPNS). In addition, they have participated in some international schemes such as Assemble+ and CORBEL, aimed at promoting the utilization of infrastructures (in Banyuls) by foreign researchers. They have been regularly invited to give seminars in national and international meetings, where the group is well recognized in the field of Chordate EvoDevo. Two Ph.D were defended during the period, with 3 articles each (1 or 2 as first author).

## Weaknesses and risks linked to the context

As almost all teams in the unit, this team experiences difficulties recruiting international students, at all levels. The team is quite small (1 MCF, 1 DR), especially as it hosts the director of the unit, and mostly incorporates French students. This forces the team leaders to look for collaborations outside, which is good in itself but does not contribute to reaching a strong critical mass for the group. The team does not participate in international training programs such as Marie Curie Networks.

The team does not describe the student's and young researchers' participation in congresses. The only participation in activities outside the station is for the leaders.

While this is a very active team, with many collaborations, surprisingly, there is no paper shared with the other teams of the unit during the evaluated period, and this does not contribute to the feeling that the Unit is an integrated subject. However, during the committee visit, the team presented ongoing collaborations with E3, on comparative analysis of mesoderm formation and with E2 on the origin and diversification of the peripheral nervous system.

## Analysis of the team's trajectory

The scientific trajectory of this group is very good. With a very small number of people but a solid network of national and international collaborators, the group has produced, always, papers of great quality. The future plans are sensible, ambitious and well organized. Despite the common experimental approaches, and similar fundamental research questions, little collaborations with other teams within the unit were described. They have been very active in the participation and organization of national and international meetings.

## RECOMMENDATIONS TO THE TEAM

### A- Recommendations on scientific production, future strategy, attractiveness

The team should continue the very good scientific production and research output, implementing novel experimental strategies and networking with scientists around the world. This team should increase interactions with the other teams of the unit. The team should increase their visibility by sharing resources and expertise on a webpage.

While they are involved in outreach activities, there is room for improvement. This would give more visibility to their research and, perhaps, help in recruiting new interested junior scientists.

### B- Recommendations on the team's organization and training

Most of the activities and papers of the team involve only the two senior members; the team will benefit from higher involvement of junior scientists to various aspects of the research endeavor.

They need to look for PhD candidates outside the French system (e.g. ITN such as Marie Curie), which seems to be a limited environment, where competition with people in other areas (i.e. biomedicine) seems to be a real limitation.

**Team 2:** Development and Evolution in Ascidians  
 Name of the supervisor: Mr Sébastien Darras

## THEMES OF THE TEAM

The team investigates the evolution of the peripheral nervous system of Ascidians. Another line of research appearing as a side project is devoted to the study of cellulose production in their tunic.

## CONSIDERATION OF THE RECOMMENDATIONS OF THE PREVIOUS REPORT

The team has initiated more collaborations with other teams of the units, as recommended in the previous report, participating in a common ANR grant with Team 1 and Team 3. The team had a sustained publication output in leading and specialized journals (detailed below). However, the team is still small (1 DR CNRS, 1 support staff) and unable to recruit junior scientists, as recommended previously.

## WORKFORCE OF THE TEAM: in physical persons at 31/12/2022

Catégories de personnel	Effectifs
Professeurs et assimilés	0
Maîtres de conférences et assimilés	0
Directeurs de recherche et assimilés	1
Chargés de recherche et assimilés	0
Personnels d'appui à la recherche	1
<b>Sous-total personnels permanents en activité</b>	<b>2</b>
Enseignants-chercheurs et chercheurs non permanents et assimilés	0
Personnels d'appui non permanents	0
Post-doctorants	1
Doctorants	0
<b>Sous-total personnels non permanents en activité</b>	<b>1</b>
<b>Total personnels</b>	<b>3</b>

## EVALUATION

### Overall assessment of the team

This team's performance, including team production and overall quality, has been rated as good. This is a small team focused on the study of developmental programs in ascidians and hemichordates. While their research is of good quality, the team has been producing at a lower rate than the rest of the Unit during the reference period, a rather surprising thing given the fact that both members are recognized experts in ascidian biology.

### Strengths and possibilities linked to the context

The team leader is an investigator with a long trajectory working on deuterostome systems, whether ascidians or hemichordates. His background in comparative embryology ensures a solid, good quality, research program in his laboratory. The major impact of the team relates to developmental mechanisms of ascidian and the development of new experimental systems for comparative analyses. The team has coordinated two ANR programmes, ANIMAL, and Ventral PNS, the second one with E1 and E3 as partners.

Though the group has been, most of the time, quite small, its production has been kept at a high standard, with 7 articles in well recognized journals, such as eLife (coordinated by the team) and BMC Biology (5 as first/last and/or corresponding author). Two Ph.D. were defended, with 2 and 3 articles respectively (and 1 or 2 as first author).

### Weaknesses and risks linked to the context

The group has oscillated over time but, mostly, is composed of very few people, recruited only in France. The small size of the team and the lack of attractiveness for students and postdocs hamper the possibilities of consolidating a stronger and more competitive team with higher publication output. The number of articles per year per full-time scientist is low (0,58).

The team does not present a list of congress participation, so we don't know if the team leader (or, preferentially, the students) are presenting and networking at international forums.

The portfolio of this team is poorly presented. Furthermore, no participation in outreaching activities is mentioned and the overall publication list is limited.

### Analysis of the team's trajectory

This is a particularly small group of researchers, and, for its size, it has been publishing few papers of great quality. This team has been, mostly, working with funds by a collaborative (ANR) Grant shared with groups E1 and E3. Other funding has been obtained from CNRS and Sorbonne Université Grants. Moreover, the participation in the mobility program Assemble+ (EU access Grant to OOB) has allowed them to develop functional genomic approaches. The fact that the team did not present a more "attractive" portfolio, detailing their best production makes it difficult to assess their public visibility and the degree of attractiveness. The future research plans follow two major axes on the evolution of the PNS (peripheral nervous system) and cellulose production. The plan is ambitious for a very small team (developing experimental tools for 5 different species of which only two are local). For this they have secured a new ANR Grant (2024-2028) called "AscidianPnsEvo".

## RECOMMENDATIONS TO THE TEAM

### A- Recommendations on scientific production and future strategy

The team should continue the good quality research by implementing novel experimental strategies and networking with scientists around the world. Moreover, since the many teams in the unit are working on different aspects of the EvoDevo in animals it would be important that they improve their interactions with teams E1 and E3 (and perhaps E7). The unit would be strengthened by the sharing of common projects between them. The team should be much more active in participating in national and international congresses.

### B- Recommendations on the team's organization and training

We strongly recommend to be more proactive by increasing the size of the team and look for PhD students through international networks (e.g. ITN Marie Curie). The team should also increase their visibility by sharing resources and expertise via social media and on a webpage, as well as engage in outreaching activities.

**Team 3:** Development and Evolution of Vertebrates

Name of the supervisor: Ms Sylvie Mazan

## THEMES OF THE TEAM

The team studies the evolution of developmental control in cyclostomes and agnathans, with a special focus on the developmental regulation of some specific structures in both embryonic and postembryonic periods. The origin of vertebrate structures is their main interest. The team has been directly involved in the sequencing and analysis of the catshark genome.

## CONSIDERATION OF THE RECOMMENDATIONS OF THE PREVIOUS REPORT

The team has been very active in the different axes in which they have divided their research program. They have pursued and deepened their involvement in projects on genomics and functional physiology of different vertebrate groups, in line with the recommendations of the previous report. Moreover, they have developed collaborative projects with other teams in the Unit, particularly team E1 and E4, which were also recommendations of the previous committee. All in all moving in the directions suggested although there are deficits in some aspects of their scientific production (see below).

## WORKFORCE OF THE TEAM: in physical persons at 31/12/2022

Catégories de personnel	Effectifs
Professeurs et assimilés	0
Maîtres de conférences et assimilés	0
Directeurs de recherche et assimilés	1
Chargés de recherche et assimilés	0
Personnels d'appui à la recherche	1
<b>Sous-total personnels permanents en activité</b>	<b>2</b>
Enseignants-chercheurs et chercheurs non permanents et assimilés	0
Personnels d'appui non permanents	1
Post-doctorants	0
Doctorants	0
<b>Sous-total personnels non permanents en activité</b>	<b>1</b>
<b>Total personnels</b>	<b>3</b>

## EVALUATION

### Overall assessment of the team

This team's performance has been rated as good to very good.

The team developed comparative studies of early vertebrate groups, mostly lamprey, cartilaginous fish and teleosts to understand the evolutionary history of neuroanatomical structures and the gene families regulating their development. A combination of genomic, histological, and functional approaches was used to understand how some brain structures, such as the habenulae, a major regulator of several neurotransmitter systems, have changed roles over evolutionary time. They have been very active in the international collaborations (among which Spain, Israel or USA), leading to many articles, although they are the leaders only in a small proportion of them. They participated in three funded ANR programmes, but no collaboration with industrial partners was reported. Other, in kind, resources were obtained, from Genoscope and from the Sanger Institute. (UK). They participated in outreach activities, but only the group leader was involved, and in just a few instances. During this period, two thesis were defended, one with the support of Région Occitanie and one supported by the doctoral school ED515, both resulting in very good publications.

## Strengths and possibilities linked to the context

This is a small group but has a core of researchers with permanent positions which allows them to plan ahead with certain confidence.

They are a research group well-recognized internationally in the field of vertebrate evolution and have a good productivity during the period assessed, with 23 papers published in well-recognized journals (e.g. Nature Communications, Frontiers in Cell and Developmental Biology etc.). They collaborate with many national and international groups in France (e.g. U. of Toulouse, ISEM - Montpellier etc.), Europe (e.g. U. of Heidelberg, U. Sevilla, U. of Cambridge etc.) and Americas (e.g. U. of Santiago and U. of Syracuse etc.) and are productive in the areas of genomics and comparative physiology of marine vertebrates. As a team they have invested a lot of energy in the preparation of materials used for their own purposes and shared with interested partners around the World (e.g. preparation of biological materials, developing TomoSeq, transcriptomes, or high-resolution 3D-Stereo-seq). In addition, they have been successful in obtaining funds to support their research; for instance they are partners in three ANR consortia (AsymBrain, VentralPNS and Mesolamphix) dealing with the evolutionary history of different organ systems. Two thesis were defended, one with three articles (one as first author), and the other one with two articles (one as first author).

## Weaknesses and risks linked to the context

The specific objectives and description of the different projects in which the team is involved are not well described in the report, but useful information was given during the visit. They include their projects on the origin and diversification of habenacular asymmetries, and the characterization of the catshark genome (in collaboration with the Sanger Institute, UK, the lamprey developmental mechanisms or the evolution of neuroanatomical areas in different vertebrates (mostly lampreys and catsharks).

This group was very productive (21 articles during the period assessed). However, the number of papers in which the team members are first or last or corresponding authors represent a small fraction (25 %) of the total output, even though they have two articles (Front. Cell. Dev. Biol. 2022 and Nature Comm. 2022) as leading authors on their core topic (axis 1, habenacular asymmetries).

They contribute to many different collaborative articles in their area of expertise (e.g. genome analysis- gene families characterization-) or the analysis of different neuroanatomical areas), but they are not leading any one of them.

The problem of attracting personnel from foreign countries is also affecting this group. They do not invest in the preparation of international projects dedicated to the hiring of PhD students (e.g. Marie Curie). An additional problem is visibility, which could be enhanced by preparing a good web page.

## Analysis of the team's trajectory

With a very small number of people but a solid network of collaborators, the group has produced, always, papers of good quality.

The trajectory of this group is an excellent one. They have a series of solid projects, based on previous developed technologies and the establishment of catsharks as model systems, that are following two major axes, one dedicated to the habenular asymmetries and their evolutionary trajectories in vertebrates and another one dedicated to the diversification of mesoderm formation in vertebrates (in collaboration with team E1, plus other external partners). In all cases the combination of molecular, developmental and functional approaches, makes the projects ambitious and innovative.

## RECOMMENDATIONS TO THE TEAM

### A- Recommendations on scientific production and future strategy

The team should continue the good quality research by implementing novel experimental strategies and networking with scientists around the world. The committee encourages the team to lead the next set of projects in this field.

### B- Recommendations on the team's organization and training

The team should invest more time and energy in finding new junior researchers, for instance by applying to Marie Curie ITN actions. The team should also dedicate time to build a web page where they share their resources and original protocols to increase their visibility. The productivity could be improved if the size of the groups was significantly bigger.

**Team 4:** Eco-Evo-Devo  
 Name of the supervisor: Mr Vincent Laudet (2017-2019)  
 Ms Laurence Besseau (2020-present)

## THEMES OF THE TEAM

The team takes an integrative approach to establish how environmental signals are translated into biological effects during critical ecological transitions. The involvement of hormones and how they regulate and synchronize organism biology with environmental cues during lifecycle transitions is a very timely core focus of the group. The research is justified based on fundamental biological questions but also the likely impact of climate change or other environmental perturbations.

The main models are teleost fish early life-stages (e.g. larvae and juvenile *Amphiprion ocellaris* (clown fish), *Diplodus vulgaris* (the two-banded sea bream) and the Mediterranean mussel, *Mytilus galloprovincialis*).

## CONSIDERATION OF THE RECOMMENDATIONS OF THE PREVIOUS REPORT

The funding track for the current reporting period indicates that the group followed the recommendations of the previous evaluation. Funding was successfully obtained from ANR for two projects they coordinate (e.g. SENSO and MANINI) and from local authorities, OFB (METOXFISH, coordinators) and Département des Pyrénées-Orientales (JUVAPORT, co-leaders), which is very good. This was achieved by placing the basic scientific ambitions in the context of socio-economic/socio-political issues. Furthermore, research towards the transversal research theme, Rhythms and Cycles in Mediterranean marine environments, was supported by Prime funding (MITI CNRS, co-leaders).

The previous committee underlined that the team lacked junior personnel. In the present period, an effort was made to attract young scientists (two new PhD students and one post-doc), which is good. Although overall team 4 has undergone high turnover in the current reporting period with the departure of the previous team leader and team members which had a considerable impact on the team's size.

The team clearly made substantial efforts to place their basic scientific research in the context of relevant applied challenges. This is very good and has paid off through ANR funding and a recognition that they have a role in the region. Nonetheless, this aspect could be further improved because the steps taken to develop key scientific strategies were less compelling.

## WORKFORCE OF THE TEAM: in physical persons at 31/12/2022

Catégories de personnel	Effectifs
Professeurs et assimilés	0
Maîtres de conférences et assimilés	2
Directeurs de recherche et assimilés	0
Chargés de recherche et assimilés	0
Personnels d'appui à la recherche	0
<b>Sous-total personnels permanents en activité</b>	<b>2</b>
Enseignants-chercheurs et chercheurs non permanents et assimilés	0
Personnels d'appui non permanents	4
Post-doctorants	0
Doctorants	1
<b>Sous-total personnels non permanents en activité</b>	<b>5</b>
<b>Total personnels</b>	<b>7</b>

## EVALUATION

### Overall assessment of the team

Overall, the activity of the team is excellent. The team is attractive, targets important and timely research questions and has a very good performance in relation to research outputs, funding, and advanced training. The team was under transition during the assessment period as the leader that formed the team in 2015 left in 2020. Nonetheless, the team has had an excellent scientific output in relation to quality with publications in well ranked generalist journals and more specialized journals and it is valued for its socioeconomic relevance as revealed by their funding track, which was very good. Excellent progress was made in establishing a new model fish species (false clownfish) that has the potential to be transformative and to result in a leading position of the team in the eco-evo-devo area. The inclusion of Mediterranean relevant species is very positive and strengthens the applied relevance of the team's research as revealed by research outputs. The training track record was moderate (two thesis defended, but one with other 15 articles, including 4 as first author), The team has a relatively low activity in outreach. Internationalization of the team is mainly linked to the previous research leader and the team reports relatively little collaboration within Europe, which is a missed opportunity.

### Strengths and possibilities linked to the context

The team was created in 2015 when the outgoing team leader joined BIOM bringing their expertise in Eco Evo Devo and molecular endocrinology. The group flourished under their leadership in terms of research output and impact through the adoption of new models, the anemonefish and more particularly the false clownfish *Amphiprion ocellaris*, that have profoundly advanced understanding of metamorphosis and ecological relevance of endocrine systems and more specifically the thyroid axis and thyroid hormones.

Establishment of facilities, closure of the lifecycle and development of biological and molecular resources for the false clownfish are a major accomplishment. The establishment of the species as a model organism gives the team a unique resource that has a high potential scientific contribution to the research area and community.

The core research lines are very timely as they integrate organisms, regulatory processes, and ecosystems. There is a clear contribution to UN SD goals "life underwater".

Work on mediterranean endemic species (e.g. *Diplodus vulgaris*) to assess anthropogenic impacts is of regional and mediterranean importance and directly responds to priorities and needs regionally, nationally, and internationally, this is excellent. The team coordinated the ANR projects SENSO and MANINI.

Research outputs in terms of publications (43 in total, including 26 as first/last/corresponding author), intensity, scientific timeliness, and association with the main research lines of the team are excellent with publications in well ranked generalist journals (PNAS, Nature communications, PLoS Biol) and more specialized journals (Coral Reefs, Aquaculture).

There is very good internationalization of the research team, although restricted to mainly Japan based on the information provided in the report.

### Weaknesses and risks linked to the context

The team was established by a scientist of international standing in the research area who left the group in 2020 along with a post-doc and PhD. There is a risk that the loss of their expertise and leadership negatively impacts the team's strategy and outputs.

It is urgent for the team to clearly establish their own research strategy and independence although the link with the previous group leader makes sense and is understandable. However, based on research outputs, the benefits for BIOM of this link are not entirely clear.

The use of tropical "aquarium models" has the potential to reduce the regional/national relevance of the research group. The adoption of mediterranean endemic species (e.g. *Diplodus vulgaris*) is a good strategy and actions to capitalize on the advantages of this species are recommended.

The funding portfolio is still limited in relation to frequency and source (primarily ANR, Regional authorities, MITI CNRS).

Based on the contents of the report, there are low levels of collaboration or networking with other Mediterranean teams or international teams (from a climate change or contaminant perspective) and this is a lost opportunity.

Outreach activities are relatively low and could be strengthened to highlight the societal relevance and visibility of the group.

## Analysis of the team's trajectory

The research team had a high turn-over as the group leader that set up the group left in 2020 taking a post-doc and PhD. One of the existing members became the group leader and the research area has remained primarily focussed on the eco-evo-devo of fish and has had a notable activity in establishing a new model well suited to studying environmental and ecological questions linked to the functional biology and encompassing molecule to ecosystem. A junior permanent member was recruited along with a post-doc and 2 PhD students. The group has now reached a stable situation and has taken advantage of this to plan their future activities, which is excellent.

The future research strategy will make use of leading-edge methodologies and technology. The current composition of the team is quite recent and may explain their less intense scientific output recently. The integration of the team within an international research laboratory (IRL) between France and Japan is very promising and has the potential to increase E4 attractiveness due to focus on iconic species and ecosystems and issues of societal concern. However, it is important that the team establishes their own clear scientific strategy and their unique identity in relation to the overall aims of IRL. The maintenance of the relationship between the team and the former team leader will be beneficial and provides an excellent way to establish new collaborations.

The planned activities for the next reporting period build on the team's pre-existing expertise and is focussed on realistic, critical, and timely questions. The areas targeted are timely and still relatively poorly studied, i.e. endocrine based modulation of recruitment using as a model coral reef fish and integrating the impact of anthropocene disruption. The inclusion of a Mediterranean species as a model is an excellent strategy to attract funding and collaborate within and outside Europe. The *D. vulgaris* model has the potential to make an important contribution. However, exploitation of the comparative perspective by the inclusion of alternative temperate models may strengthen the approach. Metamorphosis occurs in a large variety of forms in teleost fish and a "continuum" may be expected with conserved core elements irrespective of the species lifecycle. In summary, the research team has gone through a number of significant modifications in their staff, but the new leader has managed the situation well and the recruited personnel are young and highly promising. Finally, the desire to minimize their environmental impact, and to respect the recommendations 3R for their investigation, is welcome.

## RECOMMENDATIONS TO THE TEAM

Three main research lines are developed, one of which (bivalve shell biomineralization) may take valuable time from the team's main research focus and so they should reevaluate the inclusion of this research priority. The change in the leadership and structure should be seen as an opportunity to evaluate the future strategy and identity of the team, and to establish an overarching strategy with a strong link to current socioeconomic/political concerns to facilitate funding, group timeliness, and visibility. Caution should be exercised to avoid dispersion across too many scientific questions/models.

The use of an "aquarium model" fish species is interesting and significant efforts have already been spent on establishing facilities and resources. The team needs to capitalize on this by establishing the strengths and applicability of the model and promoting it to the general scientific community.

The team needs to further strengthen and diversify the funding portfolio and increase competitiveness through improved identification of the socioeconomic relevance of the research. Procurement of funding in the European arena should be made a priority as there is a good match between the group's current research and priority areas in Europe.

The research team should endeavour to widen their network of collaborators. They could use COST/Marie Curie networks or other instruments to do this or aim to get more involved in European initiatives, such as research infrastructures (their model teleost would be interesting in this perspective and SU belongs to EMBRC) or research projects. This would increase their funding visibility, collaborations, influence, and attractiveness.

Efforts should be strengthened in outreach particularly since some of the models are iconic and can exploit public interest and the research is timely on the likely impacts of pollution on marine organisms.



**Team 5:** Evolutionary and Environmental Genomics of Phytoplankton  
 Name of the supervisors: Mr Nigel Grimsley and Mr Gwenael Piganeau

## THEMES OF THE TEAM

The GENOPHY team's scientific themes are divided into two areas:

- (1) Virus diversity and molecular bases of phytoplankton-virus interactions in *Ostreococcus* and their giant viruses (Prasinoviruses, Phycodnaviridae);
- (2) Mechanism at the origin of the diversity of phytoplankton microalgae.

## CONSIDERATION OF THE RECOMMENDATIONS OF THE PREVIOUS REPORT

The recommendations made following the evaluation of the previous contract have been scrupulously respected. The team maintains or even increases the level of publications in some excellent journals (*ISME J.*, *Mol. Biol. Evol.*, *Nucleic Acid Research Rep.*, *Nature Comm.*, *Nature Ecol. Evol.*, *Science Adv.*, *Viruses*). The team continues to obtain international grants, attracts PhDs and promotes the integration of post-docs or permanent researchers. Thus, the parity (F:M) among the PhD students was adapted to give a ratio of (3:3) and 3 junior CR CNRS joined the team in 2020 and 2022. A keystone for the full development of their project was to develop skills in bioinformatics analysis, the team has tried to address this issue by providing bioinformatics training to its members..

## WORKFORCE OF THE TEAM: in physical persons at 31/12/2022

Catégories de personnel	Effectifs
Professeurs et assimilés	1
Maîtres de conférences et assimilés	0
Directeurs de recherche et assimilés	2
Chargés de recherche et assimilés	3
Personnels d'appui à la recherche	1
<b>Sous-total personnels permanents en activité</b>	<b>7</b>
Enseignants-chercheurs et chercheurs non permanents et assimilés	0
Personnels d'appui non permanents	3
Post-doctorants	2
Doctorants	4
<b>Sous-total personnels non permanents en activité</b>	<b>9</b>
<b>Total personnels</b>	<b>16</b>

## EVALUATION

### Overall assessment of the team

The GENOPHY team has an outstanding activity and high visibility at the national and international level, as demonstrated by the prestigious quality of its publications, the substantial number of invitations to international conferences and the growing number of collaborations. The team has an excellent ability to obtain new grants and an exceptional attractiveness, as evidenced by the recruitment of three junior CR CNRS researchers.

## Strengths and possibilities linked to the context

During this contract, the GENOPHY team published in some excellent journals (*ISME J.*, *Mol. Biol. Evol.*, *Nucleic Acid Research Rep*, *Nature Comm.*, *Nature Ecol. Evol.*, *Science Adv.*, *Viruses*). Among the 43 articles published, 26 were led by the team (first/last authors) and 16 were issued from collaborations including prestigious publications from the TARA-Oceans consortium (Nigel Grimsley was coordinator for the giant viruses section from 2009 to 2020).

The outstanding production and the versatility of the team and the ecological importance of their biological models contribute to its attractiveness. GENOPHY members were invited to 21 international conferences (Europe, Canada, USA, Japan,...) and they have co-organized an Embo conference (2022, Spain). Team members were guest editors in special issues of scientific journals, such as *Microbes and Environment*, *Genes*, and *Frontiers in Plant Science*. One member is associated editor for *Genome biology and Evolution* since 2019. All these solicitations enhance their reputation and attractiveness; they host microbiologists, ecologists, or biologists wishing to be trained in approaches that they do not master or little. They are developing collaborations (University of Hong Kong, University of Hamburg (EASI Genomics), the Max Planck Institute...) and have been hosting three visiting researchers. This contributed to moving their projects forward and setting up national and international funding applications. As an example, they have participated in an ITN network (Horizon 2020), and hosted two junior researchers through MSCA funding. During this contract, GENOPHY members have obtained 4 important grants in 2021 (2 ANR, 1 MSCA grant, 1 Weizman-CNRS grant). To reinforce their interactions with the socio-economic world, GENOPHY team interacted with the company NeoVirTech to detect the antiviral properties of some of their microalgae cultures (valorization project).

During the period under assessment, five Ph.D were supervised and have defended their thesis with four PhDs having published at least 1 first author paper.

## Weaknesses and risks linked to the context

The committee did not identify any significant weakness.

## Analysis of the team's trajectory

A major issue of the last five years was the renewal of the team as a consequence of the loss of three key members in 2020 (two retirements, one passed away). Three junior CR CNRS joined the team in 2020 and 2022, hence renewal of the team has taken place. The team's involvement in the TARA-Oceans project has significantly increased since 2022. For example, one member has taken the responsibility of being the giant virus coordinator for Tara-Trek (2023-2025), and another serves as Tara Oceans Coordinator. The foreseen impact on the scientific productivity in the future is an increase of the participation in TARA-Oceans integrative analyses and associated publications. Recent grant awards will also ensure financing of the team until 2026. Unfortunately for BIOM, the team has decided to join another unit of the OOB for the next contract.

## RECOMMENDATIONS TO THE TEAM

The committee wishes that the team continues on its successful path in their new environment.

**Team 6:** Marine Interactions, Evolution and Adaptation

Name of the supervisor: Mr Yves Desdevises

## THEMES OF THE TEAM

This team mainly studied the association between Sparidae and their specific ectoparasites (Monogeneans) of gender *Lamelodiscus* and the role of the external microbiota of the host on this relationship. Chemical signature and microbial communities of fish were identified using metabolomics and high-throughput sequencing, respectively.

## CONSIDERATION OF THE RECOMMENDATIONS OF THE PREVIOUS REPORT

Unfortunately, relatively few of the previous recommendations were satisfied.

The previous committee pinpointed the necessity to develop a fundraising strategy. It seems that the team applied to many calls (ANR, CNRS EC2CO, MSCA...), but the absence of funding remains the main weakness of the team.

The recommendation was made to publish in high impact journals and increase the number of publications per PhD. This was partially achieved but the total number of publications remains quite modest. Furthermore, some publications were outside of the team's main research themes (e.g. Botany...). One of the PhD students had a good scientific productivity and had several publications as a co-author, and two in 2022, and one in 2019, as the first author. Although the committee recommended that the team has contact with fishing and aquaculture companies, this recommendation was not followed.

"Team size should be increased": Unfortunately, this was not possible, and one team member became the director of OOB reducing the time they could dedicate to the research group, which was highly negative for the critical mass and implementation of the research strategy.

"A smaller number of issues to investigate should be presented": this was well achieved by focusing on the tripartite relationship between host-microbiota-parasite.

"The team should transfer their knowledge to professionals for pathogen control or conservation": this activity is not mentioned.

The previous committee also recommended developing a strategy to connect with other Biom teams": this was not realized.

## WORKFORCE OF THE TEAM: in physical persons at 31/12/2022

Catégories de personnel	Effectifs
Professeurs et assimilés	1
Maîtres de conférences et assimilés	1
Directeurs de recherche et assimilés	0
Chargés de recherche et assimilés	0
Personnels d'appui à la recherche	1
<b>Sous-total personnels permanents en activité</b>	<b>3</b>
Enseignants-chercheurs et chercheurs non permanents et assimilés	0
Personnels d'appui non permanents	0
Post-doctorants	0
Doctorants	1
<b>Sous-total personnels non permanents en activité</b>	<b>1</b>
<b>Total personnels</b>	<b>4</b>

## EVALUATION

### Overall assessment of the team

Overall, the activity of the team is good. The INTERMED team has a good reputation and a high level of expertise. The main topic of their science is original, both at an applied and fundamental level. The team members acquired new skills in the context of their scientific priorities, which make them autonomous to develop new approaches. The team is well integrated in teaching and in public outreach and dissemination, perhaps to the detriment of research time. Despite the small size of the team and the absence of funding, a good level of publication was attained.

### Strengths and possibilities linked to the context

Team 6 developed experimental approaches to assess *in vitro* the preferences of parasite larvae for the mucus of different hosts. Despite the absence of competitive funding the group maintained their scientific output (30 articles published with approximately 55% as first, last or corresponding author) primarily in specialist journals (e.g. *Animal Microbiome*, *International Journal for Parasitology*, *PLoS One*, *Scientific Reports*, *Microbial Ecology*). Members of team 6 have a high level of expertise, well-recognized knowledge and skills and have developed a good network of collaborators. They have an intense activity and quality in teaching. One Ph.D thesis was defended (with 7 articles, including 3 as first author). The experimental practices of Intermed are ethical and respect the European Union Regulations concerning the protection and welfare of experimental animals. The INTERMED team members were highly committed to communication and outreach activities for the general public.

### Weaknesses and risks linked to the context

The head of the team is now director of the OOB and this with their high teaching activities reduced available time for research and negatively impacted the group's scientific activities and output. The team is small, and their research activity and actions seem to be more the sum of the individuals than a real team with core integrated activities.

The participation of students is not clearly reflected in the team's publications, and there are discrepancies in relation to the total number of PhD students based on the various documentation supplied, which makes this aspect difficult to fully assess.

The characteristics of their research activity (not in the Evo/Devo or in the Eco/Evo/Devo themes) and the failure to achieve competitive funding motivated their non-continuation in BIOM. A positive aspect that arose during the onsite review meeting was the information that team 6 has secured several projects for the coming contract period, which is positive and a recognition of the timeliness of their research.

### Analysis of the team's trajectory

The current activities of the team outside the research unit (director of OOB and high involvement of one member in *Association des Amis du Laboratoire Arago*) and the failure to obtain funding, along with the current organization of BIOM led team 6 to transfer to another unit. This is a logical and well-reasoned decision. The reporting period assessed here was difficult for Team 6, however, the trajectory of INTERMED for the next reporting period looks much brighter since they have obtained several projects as coordinators including two from ANR. These well-funded projects will permit the team to grow and further develop their research area and expertise and to establish new collaborations in a new unit (outside of BIOM) that has higher complementarity with their research area.

## RECOMMENDATIONS TO THE TEAM

Although Team 6 will leave BIOM they will continue to work on a very important applied issue that has high importance for aquaculture. The committee strongly encourages Team 6 to take advantage of synergies in their new host group but also in BIOM.

Monogeneans infestations are a major problem for aquaculture. A better knowledge of the host-parasite relationships will be of high interest for aquaculture. So, even though the team no longer exists in the new BIOM structure, the committee strongly encourages the team members to contact and build a relationship with

aquaculture companies or associations, which could be a potential source of funding and/ or partners for future scientific projects.

The potential importance of the research for aquaculture and the demonstrated competence of the team in training and outreach leads the committee to recommend that knowledge should be transferred to professionals for pathogen control and/or conservation.

The team should aim to increase the ratio of publications per PhD. The team should pay particular attention to this aspect, which was highlighted in the last reporting period. Furthermore, it seems that one PhD student has not published an article yet. This student needs help to publish, especially since they are nearing the end of their PhD (started on 12/01/2020). Overall, students in the group should be better associated with publications since it is expected that they have a key role in the research activities.

Since the team leader will become director of the OOB, the active part of the team will be very small, so it will be important to take advantage of the new projects to gain new students and staff (particularly technical ones). So, it is strongly recommended that Team size should be increased.

**Team 7:** Regeneration, Development and Evolution of Cnidarians

Name of the supervisor: Ms Chiara Sinigaglia and Mr Lucas Leclère

## THEMES OF THE TEAM

The team addresses questions related to the development of cnidaria (a sister group to Bilateria) and their regeneration capacities, as well as evolution. Two model systems are used, the hydrozoan *Clytia hemisphaerica*, and the scyphozoan *Pelagia noctiluca*. Questions concern the mechano-chemical regulation of regeneration, the evolutionary origin, structure and regeneration of muscles in both model systems, and the evolution of the genome to implement distinct forms of the life cycle in cnidaria.

## CONSIDERATION OF THE RECOMMENDATIONS OF THE PREVIOUS REPORT

Not relevant as the team joined the unit in 2022.

## WORKFORCE OF THE TEAM: in physical persons at 31/12/2022

Catégories de personnel	Effectifs
Professeurs et assimilés	0
Maîtres de conférences et assimilés	0
Directeurs de recherche et assimilés	0
Chargés de recherche et assimilés	2
Personnels d'appui à la recherche	0
<b>Sous-total personnels permanents en activité</b>	<b>2 (starting in January 2023)</b>
Enseignants-chercheurs et chercheurs non permanents et assimilés	0
Personnels d'appui non permanents	1
Post-doctorants	0
Doctorants	2
<b>Sous-total personnels non permanents en activité</b>	<b>3</b>
<b>Total personnels</b>	<b>5</b>

## EVALUATION

### Overall assessment of the team

The past activity of the team in the unit cannot be assessed as they recently (late 2022) joined BIOM. However, their track record is excellent. The team (2 CR) presents an excellent and promising research project. Both PIs together have the required complementary expertise to conduct this project on regeneration and life cycle evolution in two cnidarian species, focusing on mechano-chemical aspects, muscle development, and genome evolution.

### Strengths and possibilities linked to the context

The project is at the forefront of regenerative biology and evolution in Cnidaria. The two team headers have complementary expertise to address the research questions they propose to study. Projects are supported by ongoing funding until the end of 2024, and the group is of sufficient size to be competitive. They have set up all the necessary equipment to perform the experiments as described and also recruited the necessary personnel (PhD and postdocs) to carry out the research in a very effective way. This team has good visibility and attractiveness thanks to their well-designed web page and a good dissemination plan.

## Weaknesses and risks linked to the context

Because this team just joined the unit, it is only possible to identify risks rather than weaknesses at this stage. The absence of technical personnel with a fixed contract dedicated to the team might create a risk for the continuity necessary to establish new experimental systems. The recent recruitment (2023) of an assistant engineer is good in this context. The projects are very ambitious and novel, and it remains to be seen whether all the avenues will end up being fruitful.

## Analysis of the team's trajectory

One of the team leaders has obtained an ATIP-Avenir grant to establish an independent research group, which started mid 2022. Both team leaders are leading experts in Cnidarian biology and they had to set-up everything from scratch, given that these model systems were not available previously in the unit. They received support from the unit for setting up the animal facility and obtaining the required imaging equipment. The research plan and specific aims are well organized and sensible.

## RECOMMENDATIONS TO THE TEAM

The team should focus on the most promising aspects of their work plan and take care to remain realistic in their expectations. We recommend that the unit supports as much as possible this young and promising team, and favor interactions with the other teams.

Funding has to be ensured for the years to come, since the PIs have shown in the past that they can be successful and obtain grant resources, it can be expected that sufficient funding will be obtained for the years to come. They should consider ERC funding.

# CONDUCT OF THE INTERVIEWS

## Dates

**Start:** November 28, 2023, 09h00

**End:** November 29, 2023, 18h00

**Interview conducted:** on-site

## INTERVIEW SCHEDULE

### Tuesday, November 28, 2023

8h30 -9h00: **Closed meeting**, Hcéres committee + Hcéres Scientific Advisor

#### Open sessions

- 9h00-9h15: Introduction (Hcéres Scientific Advisor + committee)
- 9h15-10h15: Presentation of BIOM unit (30 min presentation, 30 min discussion)
- 10h15-10h45 Team 1: Evolution and Development of Chordates (15 min presentation, 15 min discussion)

10h45-11h00: coffee break (open)

- 11h00-11h30: Team 2: Development and Evolution in Ascidians (15 min presentation, 15 min discussion)
- 11h30-12h00: Team 3: Development and Evolution of Vertebrates (15 min presentation, 15 min discussion)
- 12h00-12h30: Team 4: Eco-Evo-Devo (15 min presentation, 15 min discussion)
- 12h30-13h00: Debriefing: closed meeting of the committee

#### Open sessions

- 14h00-14h30: Team 5: Evolutionary and Environmental Genomics of Phytoplankton (15 min presentation, 15 min discussion)
- 14h30-15h00: Team 6: Marine Interactions, Evolution and Adaptation (15 min presentation, 15 min discussion)
- 15h00-15h30: Team 7: Regeneration, Development and Evolution of Cnidarians (15 min presentation, 15 min discussion)
- 

15h30-16h00 : Debriefing: **Closed meeting of the committee**

#### Restricted sessions

- 16h15-16h45: Meeting of the committee with the scientists (PR, DR, MCF, CR, IR) (without the direction of the unit)
- 16h45-17h15: Meeting of the committee with the support staff (TR, AI, IE (in French) (without the direction of the unit)
- 17h15-17h45: Meeting of the committee with the non-permanent staff (Ph.D, post-docs, short-term contracts)(without the direction of the unit)

### Wednesday, November 29, 2023

#### Restricted sessions

- 9h00- 9h30 : Meeting of the committee with the governing bodies
- 9h30-10h00 : Meeting of the committee with the direction of the unit

#### Open session

- 10h15- 11h15: Visit of experimental facilities

#### Closed sessions

- 11h15-13h00: Closed meeting of the committee
- 14h00-16h00: Closed meeting of the committee



## GENERAL OBSERVATIONS OF THE SUPERVISORS

Marie-Aude Vitrani  
Vice-Présidente Vie institutionnelle et démarche  
participative  
Sorbonne Université

à

Monsieur Eric Saint-Aman  
Directeur du Département d'évaluation de la recherche  
HCERES – Haut conseil de l'évaluation de la recherche  
et de l'enseignement supérieur  
2 rue Albert Einstein  
75013 Paris

Paris, le 1<sup>er</sup> février 2024

Objet : Rapport d'évaluation BIOM - Biologie Intégrative des Organismes Marins

Cher Collègue,

Sorbonne Université vous remercie ainsi que tous les membres du comité HCERES pour le travail d'expertise réalisé sur l'unité de recherche « BIOM ».

Vous trouverez, joint à ce courrier, les observations de portée générale sur le rapport d'évaluation transmis, du directeur d'unité que Sorbonne Université soutient.

Je vous prie d'agréer, Cher Collègue, l'expression de mes cordiales salutations

**Marie-Aude Vitrani**  
Vice-Présidente Vie institutionnelle  
et démarche participative



Hector Escriva  
UMR7232, BIOM  
Observatoire Océanologique de Banyuls sur Mer  
Av Pierre Fabre  
66650 Banyuls sur Mer  
France

Banyuls sur Mer, January 29th 2024

Dear Mr Pichereau, dear Mr Delrot, dear HCERES committee:

Firstly, we would like to express our gratitude for the committee's substantial efforts in the review of our dossier, and during the visit and evaluation process. We would like to share here some general observations about the committee's assessment.

First of all, we would like to thank the committee for the **general remark on the undisputed quality of the research carried out by all BIOM teams** during the last contract. This quality is evident in the numerous publications in high impact journals, distributed among each and every one of the BIOM teams.

We were evaluated under the wave D of HCERES, whose framework is perhaps less suited for a biology research unit. Unfortunately, **we think that some criticisms are due to the incompleteness of the information provided, caused by this imposed framework**. The size of the self-evaluation document we could submit was limited, which prevented us from accurately reporting our different activities. Unfortunately, the follow-up opportunities for addressing the gaps were not seized, neither through the written preliminary questions, nor during the on-site visit and discussions. While we cannot revise the original dossier, we can provide an example to illustrate our point. One of the criticisms regarded a perceived lack of investment of BIOM in attracting new researchers: this point is not accurate. First, **BIOM could attract and recruit a promising assistant professor** (Marc Besson), who joined team 4 and brings novel expertise in a novel teleost model and in behavioral ecology. **Several researchers also applied for competitions, such as CNRS (candidates for E1, E4 and E5) and assistant professor, albeit with varying success**. And finally, **a promising candidate was selected to apply to the ATIP-Avenir call** (discussed during the HCERES visit, but not mentioned in the report). Some of these facts were not mentioned in the report, while they are important for the trajectory of the unit.

**We have also observed a lack of consistency in the evaluation process, where certain aspects are deemed as strengths in one context and as weaknesses in another**. This inconsistency, coupled with the committee not adhering to HCERES evaluation criteria (see the "Référentiel d'évaluation des unités de recherche" on the HCERES website), diminishes the report's effectiveness in providing constructive feedback. One case we think particularly illustrates this point: publishing a high number of collaborative research papers could be considered either as a weakness or a strength, across different teams - this impacted negatively the assessment of team

E2 in particular. Similarly, a particular productivity metric - the rate of articles per person per year - was inconsistently calculated, including all staff in some teams but only researchers in others. We were also surprised by the widespread criticism about the low number of publications co-authored by members of the different teams. The HCERES guidelines ("Référentiel d'évaluation des unités de recherche") do not identify as a negative aspect the lack of publications between local teams. On the contrary, they do define as positive (see "Domain 3, Reference 1, point C5"), the co-publications with internationally recognised collaborators. These international collaborations were instead presented as weaknesses in the report, albeit inconsistently across teams, and this is also something difficult to understand. **A fair and objective assessment should follow consistent criteria applicable to all entities, as outlined by HCERES.**

The committee's focus on the departure of the E5 team seems disproportionate since it finally does not change the broad outlines of research at the level of the Observatory. This change merely reflects divergences in research themes and methodological approaches, but **it also reflects the dynamic life of a laboratory, with arrivals (such as the E7 team) and departures.** The report's emphasis on this issue may overshadow the excellent research activities of all BIOM teams, in proportion to their human and financial resources, and the overall quality and functioning of the unit. The challenges related to the attribution of space, which have created tension in the process, are circumstantial. Of note, **several prospective candidates with innovative projects perfectly fitting in the environment of a marine station have shown interest in joining our research unit, however the lack of space poses an immediate challenge. We regret that the BIOM policy, directed towards external and international recruitments of novel expertise, received no support from HCERES for the upcoming contract.**

A major criticism of the report revolves around our alleged lack of strategy or internal scientific policy. Although we clearly appreciate these comments, this is perplexing, given that the same points were praised by the committee five years ago and were evaluated positively by the staff through referendums (more than 95% of support, both 5 years ago and today). Nevertheless, we once again clarify BIOM's strategy, functioning, and scientific policy in a concise manner. **"Strategy", as defined in the dictionary means "a plan of action designed to achieve a long-term or overall aim". Our strategy is simple: to conduct high-level and innovative research, building on the specificities of a marine station, and resulting in internationally impactful publications. Our action plan involves allocating resources (i.e. staff, funding, equipment) to support teams, creating shared services (bioinformatics service BSBII; collection of marine organisms' service, video-tracking), and financially assisting teams when necessary.** BIOM operates democratically, with regular meetings and assemblies to ensure open communication and inclusivity. And finally, BIOM's scientific policy has a dual focus. Firstly, we aim to reinforce existing teams by bringing new researchers, students, and postdocs. Notably, recent years have seen successful CNRS competition applications for positions in BIOM's E5 team, while candidates for the E1 and E4 teams had less success. Additionally, there were successful applications for an MC position in the E4 team (see above). Secondly, our strategy involves leveraging the unique Banyuls-sur-Mer site and marine station to attract new teams. The preferred team profile continues to be high-quality international teams engaged in integrative biology, with a focus on original marine biological models.

The **discrepancies between the evaluations BIOM received five years ago and now can be partially explained by the different composition of the committees.** The recent HCERES

committee, was formed by HCERES panels SVE ("Life Sciences and Environment") and SVE2 ("Plant and Animal Productions (Agronomy), Plant and Animal Biology, Biotechnology, and Biosystems Engineering"), while the precedent one was formed by panels SVE2\_3 and SVE1\_1 ("Cell Biology and Plant Development Biology" and "Molecular and Structural Biology, Biochemistry," respectively). The latter committee aligned more closely with our scientific and organizational profile, and this may account for the discrepancy between our strategy/policies and the feedback of the SVE-SVE2 panel. As a result, instead of providing constructive feedback on our strategy, the report simply states that we lack one. Further, we felt disappointed that our operational approach relying on independent teams was criticized in a disparaging manner, suggesting that it was motivated by a desire for more space, rather than being project-driven. **The report reflects an ideological perspective on how a research unit should function, overlooking the actual strengths and weaknesses of our operational model** (model that, all things considered, has been amply demonstrated to work).

Despite these concerns, **the committee's criticisms, particularly those regarding communication issues with staff and challenges in national and international outreach through a suitable website and various social networks, are valid.** We appreciate and acknowledge these concerns and have taken steps to address them. Notably, we have recently mandated an external company to create a new and appealing webpage, and we have appointed a new person in charge of communication who is passionate about improving these aspects.

**In short, we believe that this visit of the HCERES committee and its evaluation is a real missed opportunity for more constructive exchanges and advice.**

Sincerely

Hector Escriva  
Stephanie Bertrand  
Sebastien Darras  
Sylvie Mazan  
Laurence Besseau  
Lucas Leclère  
Chiara Sinigaglia

The Hcéres' evaluation reports are available online:  
[www.hceres.fr](http://www.hceres.fr)

**Evaluation of Universities and Schools**  
**Evaluation of research units**  
**Evaluation of the academic formations**  
**Evaluation of the national research organisms**  
**Evaluation and International accreditation**



2 rue Albert Einstein  
75013 Paris, France  
T.33 (0)1 55 55 60 10

[hceres.fr](http://hceres.fr)

 [@Hceres\\_](https://twitter.com/Hceres_)

 [Hcéres](https://www.youtube.com/Hceres)

