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## BIOM - Biologie intégrative des organismes marins

Rapport Hcéres

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agence d'évaluation de la recherche  
et de l'enseignement supérieur

Department for the evaluation of  
research units

AERES report on unit:

Biologie Intégrative des Organismes Marins

BIOM

Under the supervision of  
the following institutions  
and research bodies:

Université Paris 6 - Pierre et Marie Curie

Centre National de la Recherche Scientifique



January 2013



agence d'évaluation de la recherche  
et de l'enseignement supérieur

Research Units Department

President of AERES

**Didier Houssin**

Research Units Department

*Department Head*

**Pierre Glaudes**



# Grading

Once the visits for the 2012-2013 evaluation campaign had been completed, the chairpersons of the expert committees, who met per disciplinary group, proceeded to attribute a score to the research units in their group (and, when necessary, for these units' in-house teams).

This score (A+, A, B, C) concerned each of the six criteria defined by the AERES.

NN (not-scored) attached to a criteria indicate that this one was not applicable to the particular case of this research unit or this team.

**Criterion 1 - C1:** Scientific outputs and quality;

**Criterion 2 - C2:** Academic reputation and appeal;

**Criterion 3 - C3:** Interactions with the social, economic and cultural environment;

**Criterion 4 - C4:** Organisation and life of the institution (or of the team);

**Criterion 5 - C5:** Involvement in training through research;

**Criterion 6 - C6:** Strategy and five-year plan.

With respect to this score, the research unit concerned by this report and its in-house teams received the overall assessment and the following grades:

- Grading table of the unit: **Biologie Intégrative des Organismes Marins**

C1	C2	C3	C4	C5	C6
A+	A	A+	A	A	A

- Grading table of the team: **Evolution and development in chordates**

C1	C2	C3	C4	C5	C6
A+	A	NN	NN	A	A+

- Grading table of the team: **Median fin formation in chordates**

C1	C2	C3	C4	C5	C6
NN	NN	NN	NN	NN	A+

- Grading table of the team: **Environment and adaptive mechanisms**

C1	C2	C3	C4	C5	C6
A	A	A+	NN	A	A

- Grading table of the team: **Evolutionary and environmental genomics of phytoplankton**

C1	C2	C3	C4	C5	C6
A+	A+	A	NN	A	A



## Evaluation report

Unit name:	Biologie Intégrative des Organismes Marins
Unit acronym:	BIOM
Label requested:	UMR
Present no.:	7232
Name of Director (2012-2013):	Mr Hervé MOREAU
Name of Project Leader (2014-2018):	Mr Hervé MOREAU

## Expert committee members

Chair:	Mr Vincent LAUDET, ENS Lyon
Experts:	Mr Eric AGIUS, Université Toulouse 3 (representative of the CoNRS)
	Ms Martha CLOKIE, University of Leicester, UK
	Mr Nicholas FOULKES, KIT, Germany
	Mr Yoav GOTHILF, University of Tel Aviv, Israel
	Mr Jehan-Hervé LIGNOT, University Montpellier 2 (representative of the CNU)
	Mr David MOREIRA, CNRS
	Mr Michel VERVOORT, Université Paris 7 - Denis Diderot

### Scientific delegate representing the AERES:

Mr Jean-Loup NOTTEGHEM

### Representative(s) of the unit's supervising institutions and bodies:

Ms Sylvie DERENNE, University Paris 6 - Pierre and Marie Curie

Mr Laurent KODJABACHIAN, CNRS, INSB



## 1 • Introduction

### History and geographical location of the unit:

The research unit “Integrative Biology of Marine Organisms” is located in the building of the Oceanological Observatory of Banyuls sur mer on the French Mediterranean coast, close to the Spanish border. The current research unit was until 2008 known under UMR 7628 (Director André PICARD succeeded by Mr Gilles BOEUF), after which and following the AERES recommendations, an intermediate administrative structure was created as FRE 3247 (Director Jack FALCON), which became FRE 3555 (Director Hervé Moreau). Ultimately this unit became in January 2011, the new UMR 7232 “Biologie Intégrative des Organismes Marins” (BIOM, Director Hervé MOREAU). Finally, in May 2012, a new research group in developmental biology was incorporated.

### Management team:

Due to its relatively small size the unit is managed by a director without deputy director and without laboratory council. The director shall convene a general assembly whenever necessary. The unit shares a secretary (50%/50%) with another laboratory that helps the administrative management of the structure.

It is important to note that the unit is part of the Laboratoire Arago a INSU observatory (OSU, directed by Mr Philippe LEBARON)) that also contains 2 other research units (UMR 7621 LOMIC directed by Mr Stephane BLAIN) and UMR 8222 LECOB directed by Ms Nadine LE BRIS) as well as a service unit (UMS 2348 directed by Mr Philippe LEBARON). This has an important consequence for the daily life of the BIOM unit as many common services as well as scientific and technological platforms are part of the UMS and are thus not directly under the responsibility of the director of BIOM.

### AERES nomenclature:

LS3

### Unit workforce:

Unit workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
<b>N1:</b> Permanent professors and similar positions	4	5	5
<b>N2:</b> Permanent researchers from Institutions and similar positions	8	8	8
<b>N3:</b> Other permanent staff (without research duties)	8	8	4
<b>N4:</b> Other professors (Emeritus Professor, on-contract Professor, etc.)	0	0	0
<b>N5:</b> Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	2	4	4
<b>N6:</b> Other contractual staff (without research duties)	1	2	0
<b>TOTAL N1 to N6</b>	23	27	21

Percentage of producers	100 %
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Unit workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	3	
Theses defended	8	
Postdoctoral students having spent at least 12 months in the unit*	2	
Number of Research Supervisor Qualifications (HDR) taken	2	
Qualified research supervisors (with an HDR) or similar positions	12	13



## 2 • Assessment of the unit

### Strengths and opportunities:

The unit is organized as a federation of independent groups: two working on invertebrate chordate evo/devo, one on planktonic marine algae and their viruses and one working on fish neuroendocrinology. As discussed below in the detailed assessment for each group, the overall quality of the unit is quite good and, most importantly, still rising. The overall impression of the committee is that the major reorganization experienced by the unit in the previous years has been positive since the overall organization of the whole structure is stable.

The addition of a new group is considered as a major asset as this brings a new model and new ideas that will fertilize the research of the whole unit despite any associated difficulties it may cause (eg in terms of lab space and most importantly animal facility organization). Such a policy must be continued.

The management of the unit seems well organized and well accepted by the members of the unit. The committee did not sense any trouble or disorder inside the unit. The flow of information and the level of discussion maintained between the various categories of staff appear adequate. The committee acknowledges the structuring and pacifying role played by the director that has succeeded in creating a dynamic and open spirit within the unit.

One key strength of the unit, as a whole but also at the level of the individual groups, is its high international visibility. This is demonstrated by the fact that the unit is integrated into large-scale European initiatives (for example marine genomics and most recently EMBRC). In addition, the unit is a resource center for the scientific community for key model organisms such as *Ostreococcus* and amphioxus. The visibility as a whole of the Laboratoire Arago, the excellent level of organization of many common services (housing etc...) and the dynamics of the whole site in terms of new buildings can also take the credit for the excellent level of international recognition. This clearly demonstrates the strong potential for synergies between the unit and the neighboring structures (OSU, UMS and UMR) and these should be encouraged.

### Weaknesses and threats:

The committee sees several aspects that are considered as weaknesses that can hamper the future development of the unit

While the unit as a whole gives a positive impression, it is clear that its scientific activity is very diverse and exhibits a lack of coherence: One group works on marine unicellular algae, two on invertebrate chordates (*Ciona* and amphioxus) and one on fish. Undoubtedly this organization is the product of a the history of the unit rather than the result of informed scientific reasoning. This is clearly an issue in terms of scientific coherence and could have an impact on the future development of the unit (see Recommendations). Given the small size of the whole structure (less than 20 permanent researchers or teachers) this is particularly important. Now that the whole structure of the lab is stable we urge the director to tackle this question and to establish, in close collaboration with the group leaders and possibly under the advice of an external advisory board, a clear strategy for the development of the unit over the next 5 years.

Within this small structure, the groups are of very unequal size, and some are critically small. Overall, the committee feels that the scope of the research in each group is too broad and the number of research programs proposed is too great. Given this, the committee does not support the proposal to create a transversal axis that would cover the search for active biomolecules in marine models. Indeed this would increase the dispersion within each team while the committee strongly believes that activities should be more focused.

The present state of the animal facilities in the Laboratoire Arago is quite worrying. The current facilities are to say the least run down and this can be taken as an understatement. The Laboratoire Arago has plans to renovate these facilities and the committee acknowledges the importance and technical difficulties of this operation. However, it appears that the timing of this effort is creating difficulties, particularly for the new team that has recently joined the laboratory.

The teaching staff of the unit are important and active. However all of them feel they are in an uneasy situation as they are far from the main campus of Paris 6 which has obvious consequences for their capacity to be implicated in key teaching meetings which establish the duties and responsibilities of teaching staff. In addition, there are possibly associated difficulties with gaining access to promising Master and PhD students. In the detailed assessment section we propose some directions to explore in this respect.





Finally, it is obvious that there are difficulties at the management level between the UMR BIOM and the OSU. While this is probably less acute in BIOM than in other UMRs, it still remains a threat as it can impact on the strategic discussions and on the decision making process (e.g. animal facility, space etc...). It must be said however that these difficulties are mainly limited to the top level (that is between the directors) and have not spread to the staff members of the OSU/UMS or the members of the UMR. We strongly urge the trustees to be proactive in addressing these issues that will severely hamper the development of the unit which is otherwise on an excellent and promising path forwards.

### Recommendations:

The unit is now stabilized in its organization and scientific life. Despite its scientific direction lacking some coherence, the committee feels it would not be wise to change the overall organization of the unit. Even if the current organization of the Laboratoire Arago in 3 research units can create management difficulties, any major decision impacting on the structure of the UMRs carries the risk of creating a shock that will have disastrous consequences. We thus strongly recommend avoiding any "top-to-bottom" decision and to carefully consult with the members of the UMR before any decision is taken.

The unit is small and composed of small groups. One of the current group leaders will retire at the end of the next 4 year term (2018). We suggest that the director and group leaders immediately start discussions to increase the strength of the unit by recruiting one or even two groups before 2018. An open international call procedure aided by an external advisory board is recommended.

There is an obvious common need for bioinformatic analysis shared by all the groups of the unit. We strongly encourage the group leader and the director to tackle this issue and to discuss this question with the directors of the other UMRs as well as the OSU.

We strongly recommend each group leader to focus their research by reducing the number of programs tackled in each of their teams. Specific recommendations are proposed in each group report, below.



### 3 • Detailed assessments

#### Assessment of scientific quality and outputs:

Despite its small size and its troubled history the scientific quality of the unit is high, a reflection of the high number of publications of each group and the international recognition obtained by most teams. Except for the Darras group (that has just been established) each group has regularly published in international journals of high quality and in some cases in top journals. Since 2006 there were 12 papers published in journals with high impact factors (IF > 10) such as *Science*, *Nature*, *PNAS*, *Plos Genet.* and *Current Biology*. Overall, the number of papers is rising in the various groups and this clearly shows that the unit as a whole is on a rising path in terms of scientific achievement and visibility.

In addition the scientific quality of the unit is also revealed by the regular publication of studies in perhaps less prestigious but nevertheless highly respected specialist journals. This clearly indicates that the expertise of the members of the unit is well recognized at the international level. This provides a clear illustration of the richness of the unit and the committee would like to acknowledge this important aspect which should be carefully taken into account in any future plans for the unit's development. It will be important to actively promote the best scientific results, as we believe that some teams have the potential to contribute major discoveries.

However, the committee generally found that given their size the projects of the various groups are not sufficiently focussed and that specific efforts should be invested to address this. The committee recognized that the broad scope of the research in each group is often a reflection of the competitive grant system at work in France. However we believe that by focusing their research activities, groups could positively impact on the quality of the research as well as on their impact. This will be discussed more specifically in each group evaluation but we strongly urge the director and the 4 group leaders to collectively implement an effort to focus their research activities. This has to be a collective discussion as it may have an impact on the funding of the unit. Within this context the committee does not believe that the transversal action proposed in the report is an appropriate strategy as its first consequence will be, for many of the groups, to broaden rather than focus their research activities.

#### Assessment of the unit's academic reputation and appeal:

The committee has noted that the international visibility of the 3 "founding" groups of the unit is excellent. The Escriva group is clearly recognized as a resource center for the amphioxus model system and has contributed several recent papers using this model including a general review in *Development*. The Falcon group expertise in neuroendocrinology is well assessed by commissioned landmark reviews as well as a strong network of collaborations. The Grimsley group is implicated in several international networks and has also collaborations with many groups abroad. These groups are well funded, in particular through competitive calls: EU projects as well as specific ANR funding and this indicates the unit's excellent reputation. Again, we consider this is a significant strength of the unit on which future development should be based. In particular, the unit's teams participate, through the Laboratoire Arago, in the EMBRC network and this is of major importance for its future development.

The committee did feel however that the academic reputation of the unit as a whole is not sufficiently promoted and could be better sustained by specific efforts at that level. The reputation of the unit should be more than the sum of the individual groups and we believe the group leaders could be more committed to work in concert to promote the reputation of BIOM. This could only have a positive impact both in terms of funding, attractiveness and international recognition. The committee is confident that if this aspect is taken into account, the impact and attraction of the unit will increase in the coming years.

#### Assessment of the unit's interaction with the social, economic and cultural environment:

The situation in terms of interactions with the general public and science popularization is quite similar to the situation concerning the academic reputation: a strong activity at the level of individual groups (see the detailed evaluation group by group) but no clear impact on the visibility of the unit. In addition, since the Laboratoire Arago is actively engaged on its own in a very active and efficient program presenting its activities to the general public, it is difficult for the unit to differentiate itself and be visible at that level. In fact, it is probably not suitable that each unit of the Laboratoire Arago searches for its own individual public recognition and we thus strongly encourage the director of the unit as well as the group leader to discuss and develop a common strategy with the Laboratoire Arago. This point will be discussed further below.



In terms of potential economic development it has to be mentioned that although the unit has a strong background in terms of basic science its wide scientific positioning should effectively allow for more applied science. Indeed several groups (Falcon, Grimsley) have connections with industry through specific contracts and patents. We don't feel that any strategy has been implemented to increase this at the level of the unit. Again, we believe a common strategy with the Laboratoire Arago should be discussed and has probably been hampered by the existing management difficulties at that level.

### Assessment of the unit's organisation and life:

The unit is organized in 4 independent groups each headed by a well identified and recognized leader. The director of the unit is not a group leader. Unit governance relies on the various groups having clear scientific and financial independence and sharing specific common resources and platforms (see below). There are frequent (ca. twice a month) meetings between the four group leaders and the director of the unit. The committee's impression is that good relationships exist between the director and the group leaders as well as between the 4 group leaders. The fact that a new group has joined the unit has been well accepted by the other group leaders and we did not notice any difficulties at that level. Given the past history that was quite troubled the committee would like to congratulate the group leaders and the director for having established such good relationships and succeeded in resolving past issues positively. We believe that the ability to productively interact and discuss should enable the PIs to develop collectively a 5 year strategic plan accepted by all.

Given the small size of the unit no Laboratory Board has been set up but regular general assemblies are organized to discuss the collective life of the unit. Again the general impression is positive. However we believe that, even if the unit is of a small size some specific actions should be implemented to promote collective life. If specific journal club seminars seem to exist on specific topics with researchers of other UMRs the committee was unclear as to how this system effectively works. We suggest that specific weekly seminars (probably journal clubs as well as results presentation) should be organized inside the unit to promote the elaboration of an in-house spirit.

Several important points should be taken into account

1) The unit is presently housed in two different buildings. We strongly suggest the director implements a reorganization of the unit in order to have all the teams working closely within the same building. The fact that there is a large ongoing building program in the Laboratoire Arago provides a unique opportunity to carry out such a reorganization. Of course, to avoid as much as possible the negative aspects of such a reorganization, this should be planned carefully, via ongoing discussions with the group leaders and the management of the Laboratoire Arago. This could only have a strong positive impact on the scientific life of the unit and will effectively promote collaborations between the groups. We are convinced that the inevitable technical and organisational issues raised by such a change could be tackled effectively.

2) The present status of the animal facility is a major problem. We believe this could hamper the scientific development of the unit. This is particularly critical for the new group (Darras) that presently cannot establish its model system in the unit even though this is an absolute priority towards the effective establishment of this group. In addition this could severely hamper the participation of the unit in major international consortia such as EMBRC.

The committee understood that a major reorganization of the animal facility is planned but the timing of this operation (2017 ?) is not acceptable given the current situation. As this problem cannot be solved by the Director on his own the committee strongly recommends to the trustees, and in particular to the INSB CNRS, to tackle this issue with the Director, the management of the Laboratoire Arago and the UPMC.

3) Most of the basic services (Computers, Housing, Finances etc...) of the units are in fact mutualized at the level of the Laboratoire Arago. We believe this is, in principle, an excellent organization and we noted in general a good level of satisfaction of the unit personnel. However we also observed that, given the communication difficulties between the unit Director and the Director of the Laboratoire Arago (OSU and UMS) there is a lack of confidence, and thus of discussions, regarding both the strategic planning and the routine organization of these services. We see as a clear priority that in the next months the trustees of the unit (CNRS, INSB, INEE and INSU institutes as well as UPMC) meet with the key people in house and solve this problem.

4) Given its size the unit is sharing a secretary with another unit of the Laboratoire Arago. Such a situation is not optimal due to continuous competition between the two assignments. We suggest this issue be tackled in the more general question of the relationships with the Laboratoire Arago.



5) For many aspects, the life of the unit is not explicitly organized. Given its small size one can avoid an overly administrative organization but we do suggest however that for key aspects (bonus system for ITAs, teaching services, mentoring system for students and post-docs etc...) an organized system should be implemented.

6) We suggest the Director discusses with the other units and establishes a specific seminar series for students and young post-docs (without PIs) allowing them to establish direct links outside their own teams and promoting interactions and contacts with groups working on different topics. The interdisciplinary nature of the Laboratoire Arago should be viewed as a plus and this is particularly true for the students and post-docs. The committee had the distinct impression that they feel some scientific isolation and that this should be avoided.

7) The committee acknowledged the existence of common imaging service within the unit and see that as a very positive point. We recommend that the organization of this service and its future development be integrated in the discussions regarding the planning of UMS platform developments. This only reinforces the importance of fostering a common strategic plan between BIOM and the Laboratoire Arago.

### Assessment of the unit's involvement in training through research:

All the groups (except the new one) comprise teachers (lecturers / associated professors/ professors) from the University Paris 6 (UPMC). In a specific meeting with the committee they expressed their difficulties in completely fulfilling their teaching duties, a situation that impacts on their careers. The committee suggested that all the teachers of the unit should join forces and establish a collective action to render their specific status more visible. The committee also feels that this question should be handled seriously at the level of the Laboratoire Arago as well as by the management of UPMC. The obligation for a teacher in a Banyuls lab to do exactly the same teaching load as a teacher in Paris, while being obliged to travel and compete for courses to teach is viewed as a particular threat to the quality of research done by these teachers. We thus believe at the very least that the travel time to Paris should be taken into account in the teaching load of these teachers as it is significantly time consuming. We also recommend that the funds available for these researchers to travel to Paris should be increased, in particular to allow them to do the networking necessary for attracting good Master and PhD students to work in Banyuls.

### Assessment of the five-year plan and strategy:

Overall the committee felt that, even if the unit seems very well managed and the quality of the research is rising there was a lack of strategic positioning for the next 5 years. With the exception of the transversal action (discussed below) the plans presented were mainly restricted to continue the research life of the unit as it is. However the committee members unanimously feel that there is scope for developing the unit and that it will face major reorganizations that will render the implementation of a strategy inevitable. We therefore consider as a priority that the Director and the group leaders set up a formal brain storming session to discuss the main aspects of such a strategy. We recommend this could be started by a one day discussion (remotely from the lab) involving the Director, the group leaders and the staff scientists (researchers, teachers and head of common services) to establish the main directions of the future strategy.

The committee wishes to express its very positive appreciation concerning the arrival of a new team (Darras) and believe that this will add significantly to the visibility and attractiveness of the laboratory. This new team should be considered as an absolute priority in terms of resource allocation: space, human resources and funds. This could include the affectation in this team of staff ITA people present in other groups. Indeed we consider that the success of this group will be a success indicator for the unit as a whole and will be a very strong argument for its future development. Therefore, all actions implemented in the next couple of years should be done taking this aspect into consideration.

Given the fact that the present scientific positioning of the unit and the taxonomic distribution of its models is quite large (algae, invertebrate chordates and teleosts) we consider that the recruitment of new teams should be considered and planned carefully. As one of the group leaders will retire at the end of the next contract period we believe there is possibly room for two additional groups. We suggest that the following principles be implemented for the recruitment of these new groups: (i) the recruitment should be done through largely publicized calls via a competitive procedure; (ii) an international scientific board should play an active role in the selection process. Note that such a SAB should not decide which group will be recruited but will aid and advise in the decision-making process, the ultimate choice should be made collectively by the Director and the group leaders; (iii) the choice of the model system to be used in new groups should be done in light of the existing models and scientific fields. Given that the group leader working in fish will retire it seems wise to anticipate the recruitment of a group working on marine fish models. (iv) If internal candidates for group leadership emerge (for example from within the Falcon groups since he will retire at the end of the period) they should be evaluated through this competitive and open procedure.



The strategy implemented by the director in collaboration with the group leaders should contain specific plans to increase the visibility of the unit in terms of publications, international networking activities, participation in long term initiatives (e.g. EMBRC) exposure in the general media etc...

In the future plans of the unit, the committee has assessed the opportunity to set up a transversal action entitled "Evolutionary and environmental risk evaluation and drug discovery" led by Anne-Marie Genevière. We would like first to acknowledge the past achievements of this researcher and the interest of her work on cell cycle regulators and more specifically the role of the kinase CDK13. The committee also acknowledges that it would effectively be an excellent initiative to promote active collaboration between the groups since this can only increase the impact of the BIOM unit. However for several reasons we were not convinced that the creation of this proposed transversal action would have such a positive impact. First it is clear that with the exception of one group (Falcon) which is already engaged in this type of research, such an activity would inevitably demand the establishment of new research programs for the other groups. As some of those groups are small (Escriva) or even very small (Darras) this could have a strong impact on their development. This is particularly critical since, as noted above, one of our recommendations is to focus the scientific direction of the various groups. Second, we feel that the project, as presented both in the written document and during a short oral presentation, is not at a stage of maturity that would allow an effective start.

There were several members of the committee who have experience in ecotoxicology and they thought that the ideas as they were presented were unrealistic with the proposed resources and timeframe. Specific questions regarding the funding, the man power involved, the scale at which it will be implemented, its focus on certain type of compounds etc...; must be carefully assessed before a go/no-go decision. Third, despite the fact that all the group leaders expressed their interest in setting up a transversal action in principle, they did not express a very strong support for such an action and they had no specific plans to effectively sustain its implementation. Fourth we question whether this transversal action could not be integrated into one of the scientific initiatives currently ongoing at the Laboratoire Arago. That there is currently a lack of strategic discussions between the management of BIOM and of the OSU/UMS should not obscure the potential for scientific platforms within the Laboratoire Arago to be used to implement BIOM interests (such as for screening small molecules using their biological resources and specific expertise).

The committee therefore encourages the Director and the group leaders to think of other possible research topics that could be developed to foster research interactions between them. As an example, the committee felt that it would be useful to identify a project that could unify the disparate research topics of the Unit and as such applauds the efforts to identify a transversal activity. Instead the committee felt that a common uniting theme could be the study of the effect of climate change on marine model organisms. We observed that this would probably be of a more genuine interest to the proposed team leaders, and with some tweaking the individual scientists within the unit could work out how their systems would respond to increasing CO<sub>2</sub>/acidity, and temperature. With some discussion between team members they could conduct a series of experiments in parallel within the laboratory by having access to a controlled set of tanks/cultures devoted to this study. It would also be interesting to explore the possibility of how they could make the most of the natural resources around them and to determine at a local level how specific natural gradients in acidity or temperature could be studied to answer these questions, and to tie in with the model data. A concerted effort such as this would be novel and inspirational and would be likely to attract media attention as well as produce work published in high profile journals. Perhaps most importantly it would allow the team to make the most of their natural setting and this unusual proximity of a scientific laboratory to the sea.



## 4 • Team-by-team analysis

**Team 1 :** Evolution and development in chordates

Name of team leader: Mr Hector ESCRIVA

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
<b>N1:</b> Permanent professors and similar positions	1	1	1
<b>N2:</b> Permanent EPST or EPIC researchers and similar positions	2	2	2
<b>N3:</b> Other permanent staff (without research duties)	1	1	1
<b>N4:</b> Other professors (PREM, ECC, etc.)	0	0	0
<b>N5:</b> Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	1	1	1
<b>N6:</b> Other contractual staff (without research duties)	0	0	0
<b>TOTAL N1 to N6</b>	5	5	5

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	1	
Theses defended	1	
Postdoctoral students having spent at least 12 months in the unit	1	
Number of Research Supervisor Qualifications (HDR) taken	1	
Qualified research supervisors (with an HDR) or similar positions	1	2



- Detailed assessments

#### Assessment of scientific quality and outputs:

The Escriva group studies the development of a non vertebrate chordate species, the amphioxus *Branchiostoma lanceolatum*, with an emphasis on the determination of the roles of the FGF signaling during the development of this species. Important efforts were also performed in order to establish tools and resources, including extensive transcriptomic data for *Branchiostoma lanceolatum*. Work of the last 5 years has led to 2 major achievements, each of them representing a significant advance in the field. The team has shown that (i) FGF signaling, acting through the MAPK pathway, is required in amphioxus during gastrulation and for the formation of the most anterior somites (but not for the posterior ones); (ii) Amphioxus has a high regeneration potential and that regeneration involves cell and molecular mechanisms showing similarities with those acting during vertebrate regeneration. Both studies were published in PNAS (2011 and 2012) with team members as first author and the PI as last and corresponding author. Collaborative work on nuclear hormone receptors and metamorphosis were also published in high profile journals. In addition, several other articles, either with major contribution of the team or in collaboration, were published in more specialized (or with lower impact) journals.

#### Assessment of the unit's academic reputation and appeal:

The group has already a strong visibility in the amphioxus and evo-devo community. The recently published work, as well as the review about the amphioxus model published in *Development* in 2011, should broaden its international notoriety and help attracting PhD students and post-docs. The team has established two fruitful collaborations in term of publications with a team in Lyon and a team in Barcelona. The team is currently funded by two ANR grants.

#### Assessment of the unit's involvement in training through research:

Team members are involved in teaching at different levels (licence and master). Two PhD students are currently working in the team.

#### Assessment of the five-year plan and strategy:

The group will focus on two main projects, (i) the role of gene duplications in the evolution of ligand binding capacities of the NRH1 family of nuclear hormone receptors and FGF receptors, using amphioxus as a model (in collaboration with teams in Pittsburgh, Lyon, and Illkirch); (ii) the role of FGF signaling during somitogenesis in amphioxus. In addition, the team will also study how neural induction is achieved in amphioxus, in the light of recently published data from the team suggesting that FGF signaling is not involved in this process in contrast to what is observed in vertebrates. The team also has a leading position in the *Branchiostoma lanceolatum* genome project currently conducted at the Genoscope. These are clearly extremely interesting and promising projects, with excellent preliminary data, that should allow the team to get both the required funding and the publication of high quality papers in the future. Another project of the team is a contribution to the 'transversal action' of the unit aiming at using different marine models for ecotoxicological studies.

As discussed above, the committee has important concerns about the feasibility of this project and the interest to include a species such as amphioxus in this kind of study, as well as about the justification for the team to participate to a project which is unrelated to its main scientific interest.





### Conclusion:

- Strengths and opportunities:

This is a small and dynamic group with a very good scientific output and promising projects. The team has a good international recognition and has shown its capacity to produce high impact data. The team has been reinforced by the arrival of one "Maître de conférence" and one "ingénieur d'étude" in the recent years. The team has the key expertise and geographic localization to be a reference laboratory for evo/devo studies using amphioxus as model. The committee congratulates the team for the important efforts that have been made in the development of the tools, including functional approaches and transient transgenesis, required for the different projects of the team and welcomes the development, in collaboration with a group from Barcelona, of a ChIP-seq approach for amphioxus as part of the FGF project.

- Weaknesses and threats:

The group is currently small considering the width of the projects. Funds for the next years are not secured and the viability of the group will depend on pending and future applications. The very poor condition of the animal facilities and the lack of bioinformatics support in the Observatoire Océanographique de Banyuls, could impede the efficient realization of the proposed projects.

- Recommendations:

The PI should be careful not to disperse its efforts in too many projects, priority should be given to the most promising ones. In this view, the committee does not encourage the involvement of the team in the 'transversal action' of the unit on ecotoxicology. In contrast, the committee encourages the improvement of the interactions and the establishment of common projects with the Darras team, as proposed by the two PIs during the visit. In addition, many collaborations have been established by the group, acting mainly as provider of amphioxus adults and technical expertise for other labs without leading to shared or important publications. While certainly interesting and reinforcing the leading position of the team in the community, these collaborations could become detrimental for the team's principal activities if they ultimately become too time-consuming.





**Team 2 :** Median fin formation in chordates

**Name of team leader:** Mr Sébastien DARRAS

**Workforce**

<b>Team workforce</b>	<b>Number as at 30/06/2012</b>	<b>Number as at 01/01/2014</b>	<b>2014-2018 Number of project producers</b>
<b>N1:</b> Permanent professors and similar positions	0	0	0
<b>N2:</b> Permanent EPST or EPIC researchers and similar positions	1	2	2
<b>N3:</b> Other permanent staff (without research duties)	1	1	1
<b>N4:</b> Other professors (PREM, ECC, etc.)	0	0	0
<b>N5:</b> Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	0	1	1
<b>N6:</b> Other contractual staff (without research duties)	0	0	0
<b>TOTAL N1 to N6</b>	<b>2</b>	<b>4</b>	<b>4</b>

<b>Team workforce</b>	<b>Number as at 30/06/2012</b>	<b>Number as at 01/01/2014</b>
Doctoral students	1	
Theses defended	0	
Postdoctoral students having spent at least 12 months in the unit	0	
Number of Research Supervisor Qualifications (HDR) taken	1	
Qualified research supervisors (with an HDR) or similar positions	1	2



- Detailed assessments

Assessment of scientific quality and outputs:

The PI has joined the BIOM in 2012 and his team will study the molecular control of embryonic development in Chordates with a particular interest in ascidian models. We will only discuss his projects as the past activity was not carried out in Banyuls.

Assessment of the five-year plan and strategy:

The team's project concerns the characterisation of the gene regulatory networks involved in the control of medial fin development during embryogenesis in ascidians and other Chordates. The proposal is very original and well-designed. This work will contribute to a molecular dissection of the regulatory cascade involved in the formation of the fin. This study should provide insight into the transfer of genes mediating cellulose deposition from bacteria to eukaryotes and the integration of this type of genes into a more complex regulatory network involved for example in fin formation.

Conclusion:

- Strengths and opportunities:

The PI is an expert in the analysis of ascidian development and the project that he is proposing is already funded by an ANR “jeune chercheur”. He has joined a rich scientific environment and a place that has a leading position in non-conventional marine models. We are thus very positive about the arrival and development of this group in BIOM.

- Weaknesses and threats:

During the discussion, a major problem concerning the animal facility was apparent and the committee wants to stress the urgent need to provide this young team with better working conditions. The committee is concerned about the size of the team (2 researchers and one technician and a post-doc to be recruited) and strongly recommends that more people should be recruited to provide an adequate work force which can realistically support the proposed projects. This project might be impaired by the lack of bioinformatics support.

- Recommendations:

The committee feels that the PI should be careful not to disperse his efforts in too many projects. The committee encourages the development of interactions and the establishment of common projects with the Escriva's team, as already proposed by the two PIs. We believe that the PI should consider using mentoring by a senior researcher in the institute, to help him start his team.



**Team 3 :** Environment and adaptive mechanisms

Name of team leader: Mr Jack FALCON

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
<b>N1:</b> Permanent professors and similar positions	2	2	2
<b>N2:</b> Permanent EPST or EPIC researchers and similar positions	1	1	1
<b>N3:</b> Other permanent staff (without research duties)	3	3	3
<b>N4:</b> Other professors (PREM, ECC, etc.)	0	0	0
<b>N5:</b> Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	1	1	1
<b>N6:</b> Other contractual staff (without research duties)	0	1	1
<b>TOTAL N1 to N6</b>	7	8	8

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	1	
Theses defended	2	
Postdoctoral students having spent at least 12 months in the unit	1	
Number of Research Supervisor Qualifications (HDR) taken	1	
Qualified research supervisors (with an HDR) or similar positions	1	2



- Detailed assessments

Assessment of scientific quality and outputs:

This team has made a considerable contribution to our understanding of fish neuroendocrinology. They have authored 43 peer reviewed articles and 15 books and book chapters. Most articles are published in leading journals in the field of comparative endocrinology, an obvious stage for a team working on 'adaptive mechanisms' and some in leading journals with a wider audience. This also includes several review papers that have become landmarks in the field. An apparent lack of very high impact factor publications is most certainly not a reliable indicator of scientific quality but is more a reflection of the "maturity" of this field. The expertise and productivity of this Banyuls team continues to lead this field to an advanced level of understanding.

Assessment of the unit's academic reputation and appeal:

They are undoubtedly world leaders addressing how melatonin production in the pineal gland is regulated by light and temperature and the evolution of AANAT. This is reflected in their consistent funding record, the PhD students and Post doctoral fellows that they have hosted as well as a long list of national and international collaborations. It has organized conferences in the field on Neuroendocrinology and biodiversity, and group members have been invited to tens of conferences during the period of examination. They have also hosted internationally known scientific visitors. Importantly, in addition to their participation in international projects, the head of the team has coordinated an EU project.

Assessment of the unit's interaction with the social, economic and cultural environment:

Outreach is evident as members of the team participated in "Fete de la Science", as well as many television and radio presentations highlighting their work. The team also has a commercial contract with Swedish and Norwegian companies

Assessment of the unit's organisation and life:

Team members are generally satisfied with the organization and management of the team with a good balance between scientific freedom and demands.

Assessment of the unit's involvement in training through research:

The team is involved in various levels of teaching. One member of the team, is responsible for 3 university courses and has lead an international master degree program. Furthermore the group has hosted and trained many PhD students as well as post docs. The relatively small number of PhDs trained is not a specific issue limited to this group but represents a more general problem relating to attracting students from Paris to study at the Banyuls marine station (see the discussion of this point above).

Assessment of the five-year plan and strategy:

Importantly, the team will extend their research on temperature regulation. The later will include investigations on the role of TRPs as temperature sensors. Wisely, a comparative approach will be taken utilizing the availability of various teleost species from different niches and temperature habitats. This is an innovative, timely and scientifically sound project. It is expected to lead to the identification of sensors and signal (temperature) transduction pathways for a wide range of ambient temperatures. The team is encouraged to consider the immense biotechnological potential of such sensors. This activity will represent an opportunity to focus activities in the group and will provide an important solid basis beyond the planned retirement of the group leader at the end of 2019.



## Conclusion:

### ● Strengths and opportunities:

This group has an undisputed world leading role in the field of fish neuroendocrinology. This is reflected by the visibility and impact of the work done by this group as well as their successful engagement in funding initiatives and international collaborations. Their future strategy to focus on an extremely relevant but complex and poorly understood issue, how fish endocrine systems are able to sense and respond to environmental temperature changes is a clever move that should guarantee the future importance and strong impact of this group.

### ● Weaknesses and threats:

An important future issue for the group will be the retirement of the group leader at the end of 2019. The apparent difficulty to attract PhD students to study in Banyuls also remains a general problem for all groups in the centre. Finally, there is a need to develop new project activities that will better bridge the existing groups and provide an enhanced visibility for the work of the unit as a whole.

### ● Recommendations:

To prepare for the retirements of group leader and encourages the applications of team members for HDR during this next funding period. They will be able to play an important role in the long term to attract PhD students via their involvement in teaching.

The committee recognize and support the application of this group for ITN funding as part of an active strategy for this group to increase the numbers of participating PhD students.

The committee encourages an increasing focus of the group on a smaller number of core activities such as the temperature sensor-related projects. It would also be advisable that more of the collaborative manuscripts produced by this group featured the group leader as senior author (where appropriate of course).

The involvement of this group in the overall Unit's plans for a "Transversal project" however is not encouraged by this committee. It is our belief that the scale and level of comitment required to successfully launch such a project has been underestimated. It is even questionable whether such an investment would translate into an improved international visibility and reputation for the Unit as a whole. Worse, it will drain valuable ressources and energy and so undermine the group's core research activities. As indicated above, however, the leader of the group should be deeply involved, together with other group leaders and the director of the unit, in planning an alternative Transversal project which will utilize the advantages of the group and the unit.



**Team 4 :** Evolutionary and environmental genomics of phytoplankton

Name of team leader: Mr. Neil GRIMSLEY

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
<b>N1:</b> Permanent professors and similar positions	1	2	2
<b>N2:</b> Permanent EPST or EPIC researchers and similar positions	3	3	3
<b>N3:</b> Other permanent staff (without research duties)	1	1	1
<b>N4:</b> Other professors (PREM, ECC, etc.)	0	0	0
<b>N5:</b> Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	1	2	2
<b>N6:</b> Other contractual staff (without research duties)	1	2	1
<b>TOTAL N1 to N6</b>	7	10	9

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	2	
Theses defended	3	
Postdoctoral students having spent at least 12 months in the unit	2	
Number of Research Supervisor Qualifications (HDR) taken	4	
Qualified research supervisors (with an HDR) or similar positions	4	5



- Detailed assessments

#### Assessment of scientific quality and outputs:

The GENOPHY team has instigated and established significant scientific activity during the last five years. It has a remarkable and well sustained production, including more than 50 articles in peer-reviewed journals and 7 book chapters. Most of these papers have been published in the leading specialized journals of the team's research field but they also appear in high-impact and large audience journals (e.g., *Genome Biology*, *PNAS*, *Science*, *Nature*, *PLoS Biology*). These articles are highly cited and some of them have become reference works in the field, a clear indications of their quality and scientific impact.

Several of the discoveries of the team during the last years have paved the way for the work done in other laboratories, either in collaboration with GENOPHY or as independent research projects. In this way, this team has played a leading role in establishing prasinophyte algae and their viruses as a new biological models for a variety of studies. This is a very important scientific contribution because it is one of the first suitable models of marine planktonic algae.

#### Assessment of the unit's academic reputation and appeal:

Members of the team are regularly invited to contribute talks in national and international meetings (44 invited lectures during the last 5 years). They have organised one international workshop, coordinated one GDR annual meeting and are involved in a number of very successful national and international collaborations with leading laboratories and institutions (Universities of Ghent, Oslo and Sussex, JGI, Moore Foundation, Genoscope, etc.) These points reveal the excellent academic reputation of the team.

Evidence for the academic credibility of the team can be seen from the observation that they have hosted a significant number of visiting scientists from several countries. Furthermore, despite the relative geographical isolation of the Banyuls laboratory, the team manages to continuously attract Master and PhD students as well as post-doctoral researchers.

#### Assessment of the unit's interaction with the social, economic and cultural environment:

The team has been very active in communicating science to society through its participation in the scientifically driven but very media-aware Tara-Ocean expedition, which has been at the origin of a large number of press, TV, and radio programs, public conferences and exhibitions. In addition, the team members take part in periodic initiatives to popularize science such as the "Fete de la Science". At a local scale, they advise the authorities as members of the Scientific Committee of the marine reserve "Banyuls-Cerbère".

The team has also been involved in applied research and interaction with industry, which has lead to 2 patents being filed which relate to enzymes involved in the biosynthesis of polyunsaturated fatty acids.

#### Assessment of the unit's organisation and life:

This aspect was obviously positive and we did not notice any obvious problem. It is important to note that the director of BIOM, H. Moreau, is the former leader of this group.

#### Assessment of the unit's involvement in training through research:

Most of the permanent researchers of the team have the HDR, which allow them to host a significant number of students. Thus, they have been very active in early-stage student supervision (4 M1 and 2 M2 per year in average). At present, they also host one post-doc funded by a prestigious German research foundation fellowship.



### Assessment of the five-year plan and strategy:

The team proposes to build on the resources and skills they have established and to further develop the same lines of research as they have in the last years. The project takes advantage of the leading expertise of the team in its biological model and of the remarkable sequence dataset that have been constructed for both the algal hosts and their viruses thanks to the finished or ongoing sequencing projects in national and international centers that have been coordinated by the team. The project is very ambitious and innovative, especially in very poorly understood areas such as the population genomics of marine plankton. The expertise of the different members of the team has been taken into account to construct a very coherent and feasible proposal. The results of this project will certainly open the possibility to extrapolate conclusions to other members of the planktonic community. In response to the intense activity of the team members to respond to grant calls, funding has already been assured for the next years to carry out a large part of the project.

### Conclusion:

- Strengths and opportunities:

The GENOPHY team is carrying out scientific research at a world leading level which has great international impact. Its publication record is excellent and has succeeded in securing funding through numerous national and international grants. It is playing a very important role in establishing marine green algae as a new biological model and attracting other laboratories to work on them. The team proposes an excellent scientific environment for PhD students and post-docs to undertake training in this research field.

- Weaknesses and threats:

The evaluation committee did not identify any significant weakness in the team. Given the huge datasets that they have to analyse, they need to reinforce their bioinformatic capacities, but this is something that needs to be treated at the level of the entire Unit since it is a general problem for the four teams in BIOM. Likewise, the team has to participate in initiatives at the level of the Unit to increase its visibility to attract PhD students and post-docs.

It is important that the team finds a good balance between the effort devoted to produce more sequence data and the one necessary to analyse and interpret all the data already acquired.

- Recommendations:

The committee congratulates the team on its research and expresses its support to develop their projects as they have outlined in their proposal.





## 5 • Conduct of the visit

### Visit dates:

Start: January 22, 2013 at 9 a.m.

End: January 23, 2013 at 1 p.m.

### Visit site:

Institution: UPMC, Oceanological Observatory of Banyuls sur mer

Address: Banyuls

### Conduct or programme of visit:

#### 22 Janvier

- 9h - 9h15           Présentation du Comité de visite et présentation de l'AERES par le Délégué : M. Jean-Loup NOTTEGHEM
- 9h15 - 9h25        Présentation de l'OSU par son directeur
- 9h25 -10h 25      Présentation de l'unité (y compris 20 mn de discussions) bilan et projet. H Moreau
- 10h25-11h15      Bilan et projet équipe 1
- 11h30-12h15      Bilan et projet équipe 2
- 13h30-14h15      Bilan et projet équipe 3-
- 14h15-15h         Bilan et projet équipe 4
- 15h-15h15         présentation (y compris 5mn de discussions) Présentation du projet transversal
- 15h15-15h45      Rencontre avec les ITA titulaires, CDD  
Auditoire : membres du Comité, Délégué AERES, sans les Tutelles, ni Direction unité
- 16h00-16h30      Rencontre avec les doctorants et post-doctorants et/ou CDD « chercheurs », Ingénieurs  
Auditoire : membres du Comité, Délégué AERES, sans les Tutelles, ni Direction unité
- 16h30-17h         Rencontre avec les chercheurs et enseignants chercheurs titulaires.  
Auditoire : membres du Comité, Délégué AERES, sans les Tutelles, ni Direction unité, ni responsables d'Equipes
- 17h-17h30         Rencontre avec les représentants de la Tutelle  
Auditoire : membres du Comité, Délégué AERES
- 17h30-18h         Rencontre avec la direction de l'unité  
Auditoire : membres du Comité, Délégué AERES
- 18h-18h45         Réunion du comité à huis clos  
Présence : membres du Comité, délégué AERES

#### 23 Janvier

- 8h30-12h           Réunion du comité à huis clos  
Présence : membres du Comité, délégué AERES



## 6 • Statistics by field: SVE on 10/06/2013

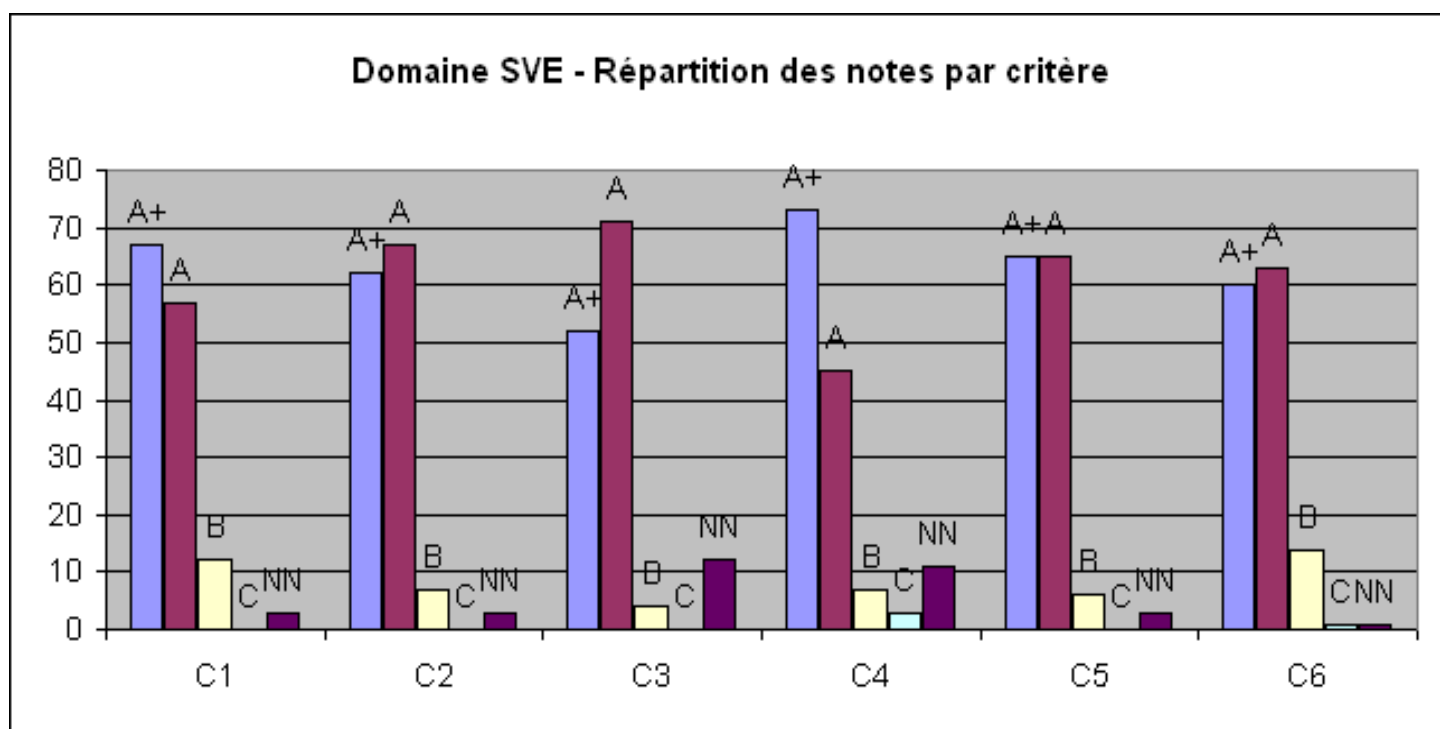
### Grades

Critères	C1 Qualité scientifique et production	C2 Rayonnement et attractivité académiques	C3 Relations avec l'environnement social, économique et culturel	C4 Organisation et vie de l'entité	C5 Implication dans la formation par la recherche	C6 Stratégie et projet à cinq ans
A+	67	62	52	73	65	60
A	57	67	71	45	65	63
B	12	7	4	7	6	14
C	0	0	0	3	0	1
Non Noté	3	3	12	11	3	1

### Percentages

Critères	C1 Qualité scientifique et production	C2 Rayonnement et attractivité académiques	C3 Relations avec l'environnement social, économique et culturel	C4 Organisation et vie de l'entité	C5 Implication dans la formation par la recherche	C6 Stratégie et projet à cinq ans
A+	48%	45%	37%	53%	47%	43%
A	41%	48%	51%	32%	47%	45%
B	9%	5%	3%	5%	4%	10%
C	0%	0%	0%	2%	0%	1%
Non Noté	2%	2%	9%	8%	2%	1%

### Histogram





## 7 • Supervising bodies' general comments

Paris le 11 04 2013

Le Président  
Didier Houssin  
Agence d'évaluation de la recherche  
et de l'enseignement supérieur  
20 rue Vivienne - 75002 PARIS

M. le Président,

Nous avons pris connaissance avec le plus grand intérêt de votre rapport concernant le projet du laboratoire Biologie intégrative des organismes marins, porté par M. Moreau. Nous tenons à remercier l'AERES et le comité pour l'efficacité et la qualité du travail d'analyse qui a été conduit.

Ce rapport a été transmis au directeur du laboratoire qui tient à remercier les membres du comité pour leur évaluation de son unité. Les membres du laboratoire ont particulièrement apprécié les échanges avec le comité lors de sa visite en janvier et reconnaissent la qualité et les suggestions constructives du rapport. Nous prenons acte des recommandations qui ont été formulées et qui n'appellent aucun commentaire particulier de notre part.

Restant à votre disposition pour de plus amples informations, je vous prie de croire, M. le Président, à l'expression de mes salutations respectueuses.

Le Vice -Président Recherche et Innovation

Paul Indelicato

