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LBI2M - Laboratoire de biologie intégrative des modèles 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:

Laboratory of Integrative Biology of Marine Models

LBI2M

Under the supervision of
the following institutions
and research bodies:

Centre National de la Recherche Scientifique

Université Paris 6 - Pierre & Marie Curie



December 2012



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, when necessary, its in-house teams) received the following grades:

- Grading table of the unit: **Laboratory of Integrative Biology of Marine Models**

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

- Grading table of the team: **Translation, Cell Cycle, Development**

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

- Grading table of the team: **Comparative Physiology of Erythrocytes**

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

- Grading table of the team: **Algal Genetics**

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



- Grading table of the team: **Marine Glycobiology**

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

- Grading table of the team: **Physiology and Abiotic Stress of Macro-algae**

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

- Grading table of the team: **Algal Chemical Defence and Signalling**

C1	C2	C3	C4	C5	C6
A	A	A	A	B	A

- Grading table of the team: **Genomics of Vibrios**

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



Evaluation report

Unit name:	Laboratory of Integrative Biology of Marine Models
Unit acronym:	LBI2M
Label requested:	UMR
Present no.:	UMR 7139 + UMR 7150
Name of Director (2012-2013):	Ms Catherine BOYEN (UMR 7139) – Mr Patrick CORMIER (UMR 7150)
Name of Project Leader (2014-2018):	Ms Catherine BOYEN

Expert committee members

Chair: Mr Dominique DE VIENNE, Paris-Sud University, France

Experts:

- Mr Abdelhafid BENDAHMANE, INRA, Evry, France
- Ms Nathalie BOURGOUNON, Vannes, France
- Mr Daniel CHOURROUT, Bergen, Norway
- Ms Melody CLARK, Cambridge, UK
- Ms Ilse CLEENWERCK, Gent, Belgium
- Mr Yves GIBON, INRA, Bordeaux, France
- Ms Kathrin GIESELER, Lyon, France, (CNU)
- Mr Herman HÖFTE, INRA, Versailles, France
- Mr Georg POHNERT, Jena, Germany
- Mr Fabrice RAPPAPORT, CNRS, Paris, France, (coNRS)
- Mr Pierre-Yves RENARD, Rouen, France
- Mr Christophe ROBAGLIA, Aix-Marseille, France

Scientific delegate representing the AERES:

Mr Dominique JOB

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

Mr Thierry GAUDE, CNRS

Mr Paul INDELICATO, Pierre & Marie Curie University (UPMC)



1 • Introduction

History and geographical location of the unit

The proposed unit is located in the Roscoff Biology Station (*Station Biologique de Roscoff*), Brittany. It will result from the partial merging of two previous research units, the UMR 7139 (Marine Plants and Biomolecules "*Végétaux marins et biomolécules*") and the UMR 7150 (Sea and Health "*Mer et Santé*"). Two of the three Teams of the UMR 7150, namely the proposed Teams 1 and 2, will join the new unit, while one Team of the UMR 7139 will not. As a result, the proposed unit will include seven teams as detailed in the Team-by-Team analysis.

Hereafter, the term "the Unit" will refer to these seven Teams together, not only for the project but also for the assessment of the past activities.

Management team

Director, Ms Catherine BOYEN, CNRS

Deputy-Director, Mr Patrick CORMIER, UPMC

AERES nomenclature

SVE 1, SVE 2 and ST 4

Unit workforce

Unit workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
N1: Permanent professors and similar positions	8	7	7
N2: Permanent researchers from Institutions and similar positions	14.95	16.95	16.95
N3: Other permanent staff (without research duties)	12.4	13.0	11.2
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)	-	1	1
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	6	6	6
N6: Other contractual staff (without research duties)	8	4	0
TOTAL N1 to N6	49.35	47.95	42.15
Percentage of producers	95.9 %		



Unit workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	11	
Theses defended	21	
Postdoctoral students having spent at least 12 months in the unit*	9	
Number of Research Supervisor Qualifications (HDR) taken	6	
Qualified research supervisors (with an HDR) or similar positions	13	



2 • Assessment of the unit

Strengths and opportunities

The leadership of the proposed Unit in brown/red algal genomics and structural biology is obvious, and beyond the proposed Unit has a remarkable diversity of expertise and skills, from molecular/cellular biology to metabolism/enzymology, physiology, development, chemical ecology and evolution.

Important results were obtained by the Unit on a multiplicity of models (autotrophic and heterotrophic, uni and multicellular, procaryotic and eucaryotic), which may be very useful not only for comparative genomics and functional genomics, but also for the analysis of biotic interactions in marine ecosystems. In addition, this multiplicity constitutes a major opportunity for fruitful relationships between scientists, industry and stakeholders.

The high-tech facilities of the *Fédération de Recherche* (FR2424) for sequencing, bioinformatics, metabolomics, structural/analytical chemistry and imaging, along with the very dynamic scientific context of the Roscoff Biology Station (*Station Biologique de Roscoff*) will provide the Unit, as for the previous merging Units (UMR 7139 and UMR 7150), with essential tools for its projects.

The Unit is very well integrated in various local, national and international networks, which attests its excellent visibility, and will permit to foster links with private companies and develop innovative applications of the results.

The Unit is strongly involved in teaching and research training, and therefore plays an important role to provide young scientists with education in marine biology. In addition the outreach activity of the Unit is exceptional, through a large variety of means, and in particular the “Cafés des sciences”.

Weaknesses and threats

The diversity of biological models and approaches is yet also a weakness, because the manpower and means allocated to each project may be not sufficient. Common technical interests and approaches create some synergies, but would not be sufficient *per se* to justify a scientifically relevant Unit project. The proposal of the Unit to define three common research objectives (Developmental processes and cell cycle, Metabolism and physiology and Biotic/abiotic relationships with environment) is relevant, but remains to be implemented in a proactive manner.

The Unit has a very solid research base in fundamental algal and microbial biology. However, there is a question about the applications of these results. Although some patents have been deposited by different Teams, collaborations and contracts with industrial partners are limited.

Another weakness of the Unit, which also concerns other Units of the Roscoff Biology Station, is the lack of space, due to a non-optimal distribution of the labs and offices in the different buildings. This limits the hosting for students and post-docs.

Recommendations

The committee encourages the members of the future Unit to continue the brainstorming in order to create more scientific synergies between the Teams, in particular to get a better scientific integration of the proposed Team 2. In addition, the committee fully supports the willingness of the Unit to attract in the Unit a new group working in Systems biology and/or Bioinformatics, which could help to integrate multi-scale and multi-model data that are accumulating exponentially (see below). The committee notes that it is now required for the Unit to lead more efforts towards the establishment of *E. siliculosus* as a model. Efforts on transformation procedures, metabolomics, etc. have to be intensified, otherwise this flagship project, hence the model organism, risk not to be broadly accepted by a wider community.

More specific recommendations

Reverse genetics is an important task that will prepare the Unit for the post-genomics era. The Unit is encouraged to increase the size of the mutant collections of *Ectocarpus* and propose a service for gene inactivation to the scientific community. Because of the low number of researchers with a bioinformatics background in the Unit, among the next challenges is to reinforce locally bioinformatics infrastructures and expertise. This will likely require attracting a new group specialized in bioinformatics and training local staff in bioinformatics.



Since the Unit masters the algae culture conditions, a comparative metabolomic approach on interesting algal metabolites produced under various stress or physiological conditions could be undertaken, allowing to identify new and interesting enzymatic pathways and enzyme clusters. Especially a high quality metabolome of *E. siliculosus* will prove useful for a concerted systems biology approach on this species. As far as chemistry is concerned, the Unit should focus on more challenging and well-defined issues instead of relaying only on serendipity driven research, despite the overwhelming amount of information gained from the genetic analysis of model organisms.

Biotechnology and blue chemistry are primarily addressed in the Unit project through the *Investissement d'Avenir* (Investing for the Future) IDEALG project (e.g. production of enzymes by bioreactors, upgrading of halogen metabolisms and the oxylipids). This IDEALG project is supported by the National Agency for Research (ANR), with 10 M€ attributed over 10 years, under the coordination of the Roscoff Biology Station. The Brittany region is rich in SMEs (small and medium-size companies) that can potentially exploit marine bio-resources for different uses (cosmetic, plant and animal health, etc.). There should be a greater emphasis with the Unit's projects on the potential applications of their basic research, especially as all research awarding bodies (National and International) are increasingly requiring commercial links to be made to improve the socio-economic impact of their funding.

The Unit aims at implementing Systems Biology to integrate multilevel (post)-genomic data with physiological or even ecophysiological data. Thus the mannitol pathway will be first modelled in *Ectocarpus*, in collaboration with a Computer Science group located at the UMR 6074 IRISA (*Institut de Recherche en informatique et systèmes aléatoires*; Information and communication science and technology) in Rennes. The move to modelling approaches to take advantage of efforts conducted in the genomics and post genomics areas appears as very wise, especially for the study of algal metabolism. It is worth mentioning that algae might provide massive advantages over terrestrial plant models to study fundamental processes. In particular, they offer very strong possibilities regarding isotopic labelling, which is a key point to study metabolic fluxes.

The Unit will be strongly involved in training of PhD students, as it is the case during the current contract. However, since there is a lack of locally organized translational biology training courses (Intellectual and Industrial property for instance) by their Parisian doctoral schools, the Unit PhDs should ask for following teaching modules offered by the doctoral schools of the Brittany's Universities .



3 • Detailed assessments

Assessment of scientific quality and outputs

The Unit benefits from an excellent publication record, with 176 publications, some of which in prestigious, interdisciplinary journals such as *Nature* (IF 36.1), *Ann Rev Plant Biol* (IF 26), *Trends Plant Sci* (IF 11), *Blood* (IF 10.5), *PNAS* (IF 9.7), *Current Biol* (IF 9.6), *PLoS Pathog* (IF 9.1), *Genome Biol* (IF 9.0), *Plant Cell* (IF 9.0), *Nucleic Acids Res* (IF 8.0), *Development* (IF 7.1), *Cell Mol Life Sc* (IF 6.6), etc. The mean impact factor is 4.9. This is noticeable because most of the projects do not use model species. There were about 92 invited conferences and 12 book chapters/books.

During the present contract, the Unit obtained remarkable results and developed key resources. Its involvement in large genomics and post-genomics programs was successful, with the cornerstone of the sequencing of the first genome of a brown alga, *Ectocarpus* (in collaboration with the Genoscope), to be used in particular for the study of life cycles and sex determination. The *Chondrus crispus* (red alga) genome project was also an important initiative, involving 37 international research groups and three commercial companies. The investigation on the algal genomes has required the identification of new partners with expertise in genomics and bioinformatics. The Unit has also developed proteomics and metabolomics approaches. An important effort has also been put into the development of RNA interference protocols and reverse genetic facility, based on the TILLING concept.

The Unit obtained other major results. Combining genomics, enzymology and structural biology, the Unit developed tools that very likely will set the standard for the international community in glycobiology, and showed that CAZymes could be transferred from marine bacteria to human gut bacteria. The Unit also identified a new 4E-translation-factor-binding protein from sea urchin and developed anti-tumour peptides, and characterized a channel of the VDAC family possibly involved in the CO₂/H₂CO₃ exchange.

Assessment of the unit's academic reputation and appeal

The academic reputation and appeal of the Unit is impressive, since it has led or has been partner of many regional (BioGenOuest, Europôle Mer, Glyconetwest, etc.), national (IDEALG and EMBRS-Fr [*Investissements d'Avenir* (Investments for the Future) supported by ANR]) and international networks (Marine Genomics Europe, ASSEMBLE, Marinexus, EMBRC, *Ectocarpus* and *Chondrus* Consortia, etc.), which reflects the large recognition of the Unit in the Marine Biology community, as also attested by the various national and international events organized by the members of these Unit. Numerous scientists of the Unit have been invited speakers in recognized international meetings and are members of expert committees and of strategic/council/scientific advisory boards (see Team-by-Team assessment). As a consequence, the Unit can be considered as being quite attractive, based on the current welcome of 11 PhD students and 9 post-docs in the Teams that will form the proposed Unit.

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

The social, economic and/or cultural impact of the Unit is very strong. Relationship with industrial partners resulted in valorization contracts and several results were patented. Private companies are in particular partners of IDEALG and Marine Biotech consortia, and academic expertise of the members of the Unit is frequently required. The OLIGOMAR project (a maturation funding project initiated by the UMR 7139 in 2010), which aims at developing new compounds derived from marine algae polysaccharides, is an innovative application in the field of human health.

The outreach activity of the Unit is remarkable, through a diversity of national and even international media (Radio, TV and newspapers). For instance, scientists of the Unit have participated in international media events organized around the "sushi" story (gene transfer from marine bacteria to human gut bacteria allowing breaking down of algal carbohydrates), including a Nature podcast. The Unit hosts middle and secondary schools for visits, participates in local events such as "La Fête de la Science", and has organised many conferences covering different topics linking science to society in the context of the Association "Café des Sciences du Pays de Morlaix" (*Association de loi 1901*, non-profit association). Thus this association contributes effectively and successfully to the diffusion of scientific knowledge to the general public. In addition, workshops have been organized aimed at the "discovery of macroalgae" and more precisely at familiarizing the public to its immediate environment. Also noticeable is the Marinexus network, based in Roscoff and Plymouth (coordination Roscoff Biology Station), which aims at giving the public information about marine ecosystem in the Western Channel.



Assessment of the unit's organisation and life

Separated discussions between the committee and the PhD students/postdocs, researchers and engineers/technicians revealed that most of them are happy to work in one or the other of the former two Units that will partially merge to create the Unit. Their management is recognized as performant, collegial and pleasant, with frequent seminars and - in most cases - fluid information exchange between the teams. There was universal agreement on the future plans and on the proposal that the former Unit leaders leads the new Unit. Such a resounding vote of support is unusual (but gratifying to hear).

The access to the facilities of the Roscoff Biology Station is easy. There are only complaints about the lack of laboratory space, the separation of the Unit between two buildings, and about the fact that the technical staff has sometimes to perform tasks that do not fall within their missions (for instance cleaning labs). The proposal for the future Unit resulted apparently from thorough discussions that started several months ago, with the objective of developing an optimized management structure within a novel unit. There was a full agreement of the staff on the future flow chart and with the proposed names for the director and deputy director. The staff just hopes that the heads of the unit will not be too overwhelmed by administrative tasks.

Assessment of the unit's involvement in training through research

With 8 professors/assistant-professors, but also with the real commitment of the researchers, the Unit is strongly involved in teaching and research training, at the Master and PhD levels (workshops and conferences in Doctoral schools), and in continuing training. The courses are given both in Paris (UPMC) and the Roscoff Biology Station. Based on past experience, the Unit will offer high-level, diversified teaching modules and research seminars. In particular, members of the Unit are strongly involved in two Master programs of UPMC, the Master of "Integrative Biology and Physiology" and the Master of "Molecular and Cellular Biology", and are in charge of different teaching units of these Master programs. Members of the Unit further coordinate the development of a new specialty "Marine Biology and Bioresources" of the Master program "Integrative Biology and Physiology". The research Teams of the Unit are affiliated with three doctoral schools: "Organismal Complexity", "Interdisciplinarity for Life Sciences" and "Natural Sciences and Human sciences: evolution and environment". The Unit provides excellent conditions for PhD students (currently 11) to perform their research work in Roscoff, with good individualized monitoring and access to high-level equipment. The students are encouraged to attend international conferences. However, there is a lack of locally organized translational training courses (Intellectual and Industrial property for instance) by their Parisian doctoral schools.

In addition, the unit is involved in the organization of two summer international courses (Marine Ecological and Evolutionary Genomics in Roscoff and Marine Genomics in Chile) and is also part of a Marie-Curie training network and of the Leonardo da Vinci European program (EU).

Assessment of the five-year plan and strategy

The proposed Unit faces a classical difficulty in Marine Biology Stations, namely the high diversity of autotrophic and heterotrophic models to be used, and the variety of scientific questions to be addressed. It is claimed that the future Unit will develop integrative approaches on marine species for addressing questions "from the cell to the organism in a marine environment". Even though comparative genomics, modelling, interface chemistry/biology/ecology and systems biology are rightly presented as unifying approaches for the Unit, at the present time some shared tools/approaches and some common scientific interests seem to be the main link between the Teams.

On the long term, or in collaboration, the adaptation of the knowledge gained on brown and red algae could be taken into account for the study of green algae, which could give more opportunities for the Unit to have ANR projects financed, which is one of the few weaknesses of the Unit during the current contract.

In addition, relational issues resulted in a not optimal composition of the proposed Unit. In particular, one Team, working on morphogenesis in brown macro-algae, will move in another Unit (if created) while connection with the proposed Team 3 (Algal Genetics) was more obvious. Moreover the lack of scientific overlap between the proposed Teams 1 and 2 ("Translation, Cell Cycle, Development" and "Comparative Physiology of Erythrocytes", respectively) and the rest of the Unit deserves more efforts to be fully convincing.



In conclusion, even though the proposed Unit results from in-depth discussions and common willingness to work together, the committee regrets that the coherence of the scientific strategy, in connection with the projects of the other Units of the Roscoff Biology Station, could not be the only criterion in consideration when preparing the future contract.



4 • Team-by-team analysis

Team 1 : Translation, Cell Cycle, Development

Name of team leader: Mr Patrick CORMIER

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
N1: Permanent professors and similar positions	3	3	3
N2: Permanent EPST or EPIC researchers and similar positions	2	2	2
N3: Other permanent staff (without research duties)	1.8	1.8	1.8
N4: Other professors (PREM, ECC, etc.)	0	0	0
N5: Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	0	0	0
N6: Other contractual staff (without research duties)	0	0	0
TOTAL N1 to N6	6.8	6.8	6.8

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	1	
Theses defended	3	
Postdoctoral students having spent at least 12 months in the unit		
Number of Research Supervisor Qualifications (HDR) taken	1	
Qualified research supervisors (with an HDR) or similar positions	4	



• Detailed assessments

Assessment of scientific quality and outputs

The Team has produced significant results that were published in very good interdisciplinary journals (*Nucleic Acids Res* (IF 8.0), *J Cell Science* (IF 6.1), *Dev Biol* (IF 4.0)). Among the remarkable results are the identification of a new 4E translation-factor binding protein from sea urchin and the development of a translation inhibiting peptide with a potential anti-tumoural role, which led the Team to file a patent on anti-tumoural peptides. Also, using structural and in silico approaches the Team identified a new 4E-interacting protein (4E-IP).

Assessment of the unit's academic reputation and appeal

The Team has several national and international collaborations in the field of cell translation research, is a member of several networks and has attracted reasonable funding from local and national sources. It is partner in a single ANR project. The Team leader and other scientists have been regularly invited in international meetings (Developmental Biology of the Sea Urchin, Young Scientist Forum OzBio 2010, Proust Conferences). Team members are members of several expert committees ("*Conseil National des Universités*" CNU, European Community).

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

The Team is strongly involved in public communication. It has organized several conferences covering many topics linking science to society, such as "Café des Sciences", "Sciences en fêtes" and participated in several scientific expositions. It is involved in translational research.

Assessment of the unit's organisation and life

The head of the Team is proposed to be the deputy Director of the Unit. He was previously Director of another unit in the same research campus (Roscoff Biology Station; UMR 7150). Clearly a lot of effort has been invested in preparing the new project with the objective of developing an optimized management structure within the newly enlarged Unit.

Assessment of the unit's involvement in training through research

This is one of the real strengths of the Team. It comprises three "research teachers" (*enseignants-chercheurs*), who are heavily involved in teaching and organizing courses at the M2 level. Six PhDs have been trained since 2008.

Assessment of the five-year plan and strategy

The Team proposes to continue their work on translational regulation during fertilization and remobilization of stored mRNA in sea urchins. They have acquired a good international reputation in this area.

The Team also proposes to implement their knowledge and methods in translational control analyses to algal models. However, although there is no doubt that translational regulation factors are largely conserved between metazoan and algae, there is no evidence yet of a physiological or developmental situation in algae where translational regulation research will be pertinent, as it is during fertilization in sea urchin. Since this project is not hypothesis-driven, it is unclear how it will impact on the specific biological questions raised by brown and red algae biology and this area of proposed integration may require further consideration. Given the current reputation of the Team in sea urchin cellular biology, this must not be diminished for the sake of forcing integration within the Unit. Also the development of tools for functional analysis and cell biology in algae cells will be mandatory (this is a general requirement for the Unit to become leader in red and brown algae biology).



Conclusion

- Strengths and opportunities

The Team has an excellent reputation in the area of translational control and their work on the sea urchin has led to some novel results, with the identification of new genes, molecular interactions and potential therapeutic agents. The latter, in particular bears real promise for the future through linking sea urchin research to medical applications.

- Weaknesses and threats

The Team already is stretched in terms of resources due to teaching commitments. The development of the new larger Unit and the requirement for integration may detract the Team from its current highly successful research. The Team leader will be the Deputy Director of the enlarged Unit and this may impact on his research and Team contact time.

- Recommendations

The integration of the Team within the LBI2M laboratory is still a challenge that needs to be further addressed by both the Team members and the head of the Unit. The efforts in sea urchin translational control should not be diluted by forcing integration within the newly enlarged Unit, particularly when appropriate tools still need to be developed in the algae, to ensure a similar level of research capability in this area.



Team 2 : Comparative Physiology of Erythrocytes

Name of team leader: Mr Stéphane EGÉE

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
N1: Permanent professors and similar positions	2	2	2
N2: Permanent EPST or EPIC researchers and similar positions	1	1	1
N3: Other permanent staff (without research duties)	1.8	1.8	1.8
N4: Other professors (PREM, ECC, etc.)			
N5: Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	1	0	
N6: Other contractual staff (without research duties)			
TOTAL N1 to N6	5.8	4.8	4.8

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	1	
Theses defended	3	
Postdoctoral students having spent at least 12 months in the unit	0	
Number of Research Supervisor Qualifications (HDR) taken	0	
Qualified research supervisors (with an HDR) or similar positions	1	



• Detailed assessments

Assessment of scientific quality and outputs

The focus of the research conducted by the Team is on the electrophysiological properties of red blood cells. More specifically, since 1999 80% of the efforts are concentrated on human erythrocytes. Being composed of three permanent researchers (1 full researcher and 2 assistant professors), the Team concentrates on three subjects: comparative physiology of ionic channels in erythrocytes membranes, characterization and physiological roles of ionic channels in human erythrocytes in relation to disease, and plasmodium infected red blood cells. Among these three axis, only the two latter have led to original publications. With regard to the first axis, preliminary results suggest that the membrane of erythrocyte from basal vertebrates bears a channel of the VDAC family that could be involved in the CO₂/H₂CO₃ exchange. In total the Team has published 18 articles with one of the Team members as PI: 1 *Blood* (IF 10.5), 1 *Plos Pathogens* (IF 9.1), 1 *PNAS* (IF 9.7), 1 *PloS One* (IF 4.1), 1 *FEBS Journal* (IF 3.8), etc. and 1 review in *Trends Parasitol* (IF 5.2). The overall scientific production appears as an important contribution to the domain as attested by publications in highly selective international journals.

Assessment of the unit's academic reputation and appeal

One of the Team members has been invited to an oral presentation at the Red Cell Club Conference and the Team is in charge of the organization of the next Conference that will be held in 2015. The Team belongs to the few laboratories that lead this type of research in the world. The Team has difficulties for attracting PhD students on their subjects, despite their involvement in teaching, in a Marie Curie training network (one Marie Curie PhD) and their affiliation to the Leonardo da Vinci program (EU) of the University of Wroclaw (Poland). The Team is a partner in one ARN grant.

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

No elements were provided in the report to allow the assessment of the social, economic and cultural impact of the Team. The committee concluded therefore that the Team is absent from this context.

Assessment of the unit's organisation and life

The Team has a stable composition (2 senior lecturer and one CNRS research director). Each Team member is more specifically in charge of one of the three axis. Yet, there are clearly common scientific and methodological issues so that the Team is more than the sum of the individuals. As mentioned above, the Team has difficulties to attract PhD scientists and this might relate to the fact that students interested in the electrophysiology of red blood cell would not spontaneously search for a lab in a Marine Station.

Assessment of the unit's involvement in training through research

The principal contribution of the Team was designing, teaching and coordinating three teaching units of the Master degree in Integrative Biology and Physiology and International Master Degree. The Team was also part of a Marie Curie training network (one Marie Curie PhD) and integrated into the Leonardo da Vinci European program (EU) of the University of Wroclaw (Poland), which resulted in a 6-month stay of seven students, of which two completed their PhD during their stay in the Teams laboratory.



Assessment of the five-year plan and strategy

The project is essentially the continuity of the research conducted during the passed term with three main axis: i) comparative physiology of red blood cells channels using two vertebrates models (lamprey and dogfish), ii) involvement of ionic channels in physiological and pathophysiological situations and iii) physiological role of ionic channels upon infection by *P. falciparum*. In itself the project is satisfyingly elaborated and relies on the safe grounds established during the previous term, except for the “comparative physiology” axis, that shows some weaker aspects: it is based on transcriptomic approaches (conducted in collaboration with Team 5, Algal physiology and Abiotic Environment, in the proposed Unit) while the genome of the two chosen animal models is not yet available. Also, lampreys are only available during a short periode of time per year since optimal conditions to keep them a long time in good health suitable for functional analysis are so far missing. Because of this, it may be difficult to achieve the aim of this axis.

More generally, efforts are made to identify overlapping scientific interest with the other Teams in the proposed Unit witnessing the concern of the members of the Team and of this Unit to integrate the new comers. Notwithstanding these, the overlap appears, for now, at best tiny and, at worse, contrived.

Conclusion

● Strengths and opportunities

The Team members have a solid and rare expertise in electrophysiological approaches applied to red blood cells. They have identified recently important consequences of the infection of erythrocyte by *P. falciparum* on the electrical conductance of the red blood cell membrane.

● Weaknesses and threats

The project is conducted in a scientific and geographical context that strongly limits the possibilities of the Team members to interact and be challenged with colleagues sharing their scientific interest.

● Recommendations

The integration of the Team within the new Unit is a major challenge that needs to be addressed by both the Team members and the head of the Unit. There are clearly questionmarks remaining and the strategy that has been opted for is still to be clarified. Solutions to this issue should rely on a clearly identified scientific question, the answer to which requires the expertise and skills of electrophysiologists. Attempts to artificially develop axis with the unique goal to legitimate the fact that this Team is part of the new LBI2M Unit should be avoided. As regards to this issue, one may question the appropriateness of the comparative physiology approach for which essential tools are lacking and that presently appears as an artificial introduction of a marine model that would justify the integration of the Team to the new LBI2M Unit.



Team 3 : Algal Genetics

Name of team leader: Mr Mark Cock & Ms Susana COELHO

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
N1: Permanent professors and similar positions	0	0	0
N2: Permanent EPST or EPIC researchers and similar positions	2	2	2
N3: Other permanent staff (without research duties)	1	1	1
N4: Other professors (PREM, ECC, etc.)	0	0	0
N5: Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	3	2	2
N6: Other contractual staff (without research duties)	1	0	0
TOTAL N1 to N6	7	5	5

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	3	
Theses defended	1	
Postdoctoral students having spent at least 12 months in the unit	3	
Number of Research Supervisor Qualifications (HDR) taken	0	
Qualified research supervisors (with an HDR) or similar positions	1	



• Detailed assessments

Assessment of scientific quality and outputs

The focus of the research conducted by this Team is on *Ectocarpus siliculosus*. The Team has strived to establish this organism as a model for brown multicellular algae and the completion of the sequencing and annotation of the genome is the strongest evidence of its success. This being done, the Team members move on and address the question that grounded the will to establish *Ectocarpus* as a model, the developmental processes in this unusual group of organisms. This focus is supported by the Team's finding that suggest an independent evolution of multicellularity. In addition to, or besides the establishment of *Ectocarpus* as a model organism for developmental genetics, the Team concentrates on two main aspects: sex determination and the regulation of the major life cycle transitions. The overall scientific production is outstanding. There are 18 articles in peer-reviewed journals with at least one of the Team member as PI: 1 *Nature* (IF 36.1), 2 *PNAS* (IF 9.7), 1 *Curr Biol* (IF 9.6), 1 *Development* (IF 7.1), 1 *Plant Physiol* (IF 6.6), 5 *New Phytol* (IF 6.5), 1 *J Exp Bot* (IF 5.4), etc.

Assessment of the unit's academic reputation and appeal

The Team is recognized as leader in the genetics of brown algae, following key publications as well as coordination of the *Ectocarpus* genome project, which resulted from and led to important international collaborations. A prominent role has been played in the promotion of this new model system through the organization of and participation in several international conferences.

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

Even though the Team is highly focused on scientific excellence in its field, its leaders have contributed to the popularization of their research on multiple occasions, nationally and internationally.

Assessment of the unit's organisation and life

The Team appears to function efficiently and smoothly, with a dynamic group of early stage researchers and despite a relatively weak level of technical support. Both Team leaders have a strong interaction, together and with the rest of the proposed Unit, as illustrated by their activity within the former research Units. The two permanent researchers in the Team have a strong and fruitful interaction, yet, they both conduct their own research project in a complementary manner.

Assessment of the unit's involvement in training through research

The Team is training its own young scientists through supervising their ambitious research projects. Its involvement in teaching activities is significant. The Team is attractive having trained 3 PhDs and 3 Post-docs.

Assessment of the five-year plan and strategy

The project is essentially the continuity of the previous research axis and will capitalize on the remarkable results obtained in *Ectocarpus* genomics. It is ambitious but the possible difficulties are clearly identified by the Team members. Overcoming current technical problem inherent to new model systems and particularly the genetic transformation of *Ectocarpus* will be crucial. The challenge will be to produce new knowledge on life cycle transitions and sex determination of *Ectocarpus*, with evolutionary implications valid beyond the brown algae model system. This calls for a strong support to this Team, which could be embodied by an increased level of technical assistance.



Conclusion

- Strengths and opportunities

The achievement of the *Ectocarpus* genome project obviously gives a strong momentum to the Team that is internationally recognized as the leader in this field. The emergence of new tools will boost the research axis that already relies on solid grounds and are conducted in a solid and well structured maner.

- Weaknesses and threats

The main weaknesses lie in the difficulty to implement the molecular and genetic tools required to conduct the different research projects that are proposed. This difficulty, which is inherent to any ambitious project such as the one assessed here, is however clearly identified by the Team members.

- Recommendations

Considering the challenges that still need to be undertaken, future developments will probably require an increase in terms of manpower. This could be embodied by an increase level of technical assistance. Alternatively, the direction of the proposed Unit could manifest its will to support this Team by supporting the recruitment of an additional permanent scientist.



Team 4 : Marine Glycobiology

Name of team leader: Ms Mirjam CZJZEK

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
N1: Permanent professors and similar positions	2	2	2
N2: Permanent EPST or EPIC researchers and similar positions	4.45	4.45	4.45
N3: Other permanent staff (without research duties)	1	2	2
N4: Other professors (PREM, ECC, etc.)	0	0	0
N5: Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	2	2	2
N6: Other contractual staff (without research duties)	1	1	0
TOTAL N1 to N6	10.45	11.45	10.45

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	1	
Theses defended	4	
Postdoctoral students having spent at least 12 months in the unit	1	
Number of Research Supervisor Qualifications (HDR) taken	2	
Qualified research supervisors (with an HDR) or similar positions	4	



• Detailed assessments

Assessment of scientific quality and outputs

Excellent publication record: 40 publications, some of which in top journals (2 *Nature* IF 36.3, 1 *Ann Rev Plant Biol* IF 25.9, 1 *Plant Cell* IF 8.9, 2 *New Phytol* IF 6.6, 1 *Plant Physiol* IF 6.5, 5 *J Biol Chem* IF 4.8). With the exploitation of the *Ectocarpus* sequence and the development of the *Zobellia* system, the Team has developed tools that very likely will set the standard for the international community. The combination of genomics approaches with enzymology and structural biology is well-chosen and provides a solid base for sustainable success. Despite the large number of possibilities the Team has been able to make the right choices and to exploit opportunities as illustrated by the “sushi paper” in *Nature*.

Assessment of the unit's academic reputation and appeal

Researchers of the Team have been invited for 10 international conferences. The PI has coordinated a FP7 program and has participated in the organisation of 3 international conferences..

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

Team scientists have participated in international media events organized around the sushi story, including a nature podcast. The Team participates in local events such “la science en fête”. Three patents have been deposited.

Assessment of the unit's organisation and life

Although it is difficult to judge from the information provided, the strong interaction between Team members around a common project and the sharing of tools suggest that the Team is well managed. In addition, the Team has strong interactions with other Teams in the former Unit that will merge to form the proposed Unit and shares its structural biology expertise with them.

Assessment of the unit's involvement in training through research

Three PhD theses were defended in the period, and the PI has organized a workshop on crystallography. However, judging from the document and the presentations, the Team is not so much involved in training/teaching, choosing to focus mainly, and successfully, on research.

Assessment of the five-year plan and strategy

The project is ambitious but would benefit from a better focus. The “brute force” combination of genomics and structural biology appears to be rather technology-driven and does not carry much risk in itself (interesting structures undoubtedly will be found). However, a better conceptual framework is needed in order to increase the impact of the research beyond the algal community.



Conclusion

- Strengths and opportunities

Excellent combination of genomics and structural biology. Possibility to have a strong impact on our understanding of the evolution of cell wall polysaccharide-active enzymes.

The discovery of related *Ectocarpus* strains or species that are more or less adapted to fresh water, may allow the adaptations of cell wall polyaccharides to changing ionic environments to be studied, which may contribute to our understanding of the colonization of terrestrial environments. This may be an area for a close collaboration with Team 5.

- Weaknesses and threats

With the overwhelming quantity of information that has become available from the various genome sequences, the Team should avoid to spread out its efforts too thinly by resisting the temptation of cherry picking. Whereas glycosyl hydrolases can be relatively easily produced in heterologous systems and crystallized, the study of glycosyl transferases is much more challenging since they are often membrane-bound, part of high molecular weight complexes and the substrates and acceptors are often hard to identify. It is probably inconceivable to study at the same time the biosynthesis of laminarin, alginate and carageenan in addition to all the glycosyl hydrolase work, the cell wall structural work and the bacterial metagenomics.

- Recommendations

A more careful focus of the Team on a small number of overarching scientific questions (eg. horizontal transfer between microorganisms-algae, structural biology and evolution of polysaccharide biosynthesis, adaptation of cell wall organisation to fresh water, ...) is needed to secure the impact of the Team beyond the algal community. Such a broader impact also should facilitate obtaining financial support from the ANR.



Team 5 : Physiology and Abiotic Stress of Macro-algae

Name of team leader: Mr Thierry TONON

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
N1: Permanent professors and similar positions	2	2	2
N2: Permanent EPST or EPIC researchers and similar positions	1.5	1.5	1.5
N3: Other permanent staff (without research duties)	0.8	0.8	0.8
N4: Other professors (PREM, ECC, etc.)	0	0	0
N5: Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	1	1	1
N6: Other contractual staff (without research duties)	1	0	0
TOTAL N1 to N6	6.3	5.3	5.3

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	2	
Theses defended	2	
Postdoctoral students having spent at least 12 months in the unit	0	
Number of Research Supervisor Qualifications (HDR) taken	2	
Qualified research supervisors (with an HDR) or similar positions	3	



• Detailed assessments

Assessment of scientific quality and outputs

The Team has contributed to scientific papers in *Nature* (IF 36.1 - the *Ectocarpus* genome paper) and *Genome Biology* (IF 6.9 - last authors on expression analyses in *Ectocarpus*), along with a number of articles in *Plant Journal* (1 paper; IF 7.1) and in *New Phytologist* (6 papers; IF 6.5). This demonstrates that the Team members are reaching the highest international standards and are gaining considerable recognition outside of their immediate field. With the genomes of both *Ectocarpus* and *Chondrus* published/in press and their development of tools for the functional analysis of these genome data, they are pushing forward the field of algal genomics and are recognised as leaders in their field. The strategy of genome sequencing of the UMR7139 (one of the two research Units merging to form the proposed Unit), which was viewed as high risk by the visiting committee in the previous AERES evaluation, is starting to produce rich scientific rewards.

Assessment of the unit's academic reputation and appeal

The researchers are invited to present their results at leading international events (Phycol. Soc. Amer., Charleston; Okazaki Biology Conference, Japan; Conference Jacques Monod, France, etc.). The former Team leader is clearly an internationally recognised leader in the field of Marine Sciences (she led the Marine Genomics Europe Network of Excellence, and is member of various councils, advisory boards and committees). The Team coordinates the Consortium for *Chondrus* genome project, and contributed several European position papers.

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

As detailed above, this Team is a reference in the field of extra academic expertise. With the sequencing and exploitation of the seaweed genomes, this group has considerable links with industry. For example the former Team leader is the Co-ordinator of the axis "Marine Genomics and Blue Chemistry" of the GIS (*Groupement d'Intérêt Scientifique*) Europole Mer, the EU Coordination and Support Action (CSA) project on Marine Biotech, also being on the management committee of Biogenouest, etc. Furthermore, this Team has contributed significantly to the "Investissement d'Avenir" IDEALG project, which has 4 industrial partners. They are also engaged in numerous outreach activities.

Assessment of the unit's organisation and life

The management of the Team was considered as being performant and collegiate by all members of staff and partners, with easy communication and scientific exchanges.

Assessment of the unit's involvement in training through research

The Team has co-supervised 5 PhD students, received visiting PhD students and is co-ordinating several teaching modules within international master and PhD programmes. It is also involved in the co-ordination of the Summer course on Marine Ecological & Evolutionary Genomics advanced training course for PhDs and post-docs.

Assessment of the five-year plan and strategy

The 5-year plan presented is very ambitious and seeks to exploit the genome data developed during the previous 5-year period. The Team will continue to lead the field and will develop new research avenues, however the committee felt that there was a lack of focus and there was concern about the impact of the IDEALG project on the staff time available within the group to pursue more basic research and the fact that this major project will, to a certain extent, steer certain research avenues. The committee would have liked to see a stronger steer on the future research plans from the new Team leader, as the former one will clearly take a lesser role within the Team due to her increased responsibilities heading up the Unit.



Conclusion

- Strengths and opportunities

The Team is clearly a leader in the field of Algal genomics. With the development of tools, it will continue to act as a reference for researchers in this field. With the genome sequences, there are clearly considerable opportunities in the biotech area, as evidenced by the awarding of the IDEALG project, in which this Team plays a major role. The Team is very interdisciplinary, which allows efficient exploitation and flexibility in research approach. The numerous international and national connections of the proposed head of new Unit will also enable the Team to maintain a strong profile and provide opportunities for development of large projects and grants.

- Weaknesses and threats

There is a trade-off between research and teaching load as two out of the three PIs are lecturers, which will impact on their research time. Additionally with the former Team leader leading the Unit and her involvement in national and international bodies, she will have less time to interact with the Team and help with developing the leadership capabilities of the new Team leader. Whilst the new Team leader has received a UPMC emergence project, his management experience is relatively limited and this is an ambitious project. On the technical side there are still problems with the transformation of *Ectocarpus* and *Chondrus*, which hampers the application of genetic approaches.

- Recommendations

This is a Team with an excellent track record that will continue to develop the field of algal genomics and functional approaches, but the committee feels that there is a requirement for a more rigorous strategic review of the proposed research to fully justify further sequencing and also how the commitments from the IDEALG project will impact on the overall research of the Team.



Team 6 : Algal Chemical Defence and Signalling

Name of team leader: Ms Catherine LEBLANC

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
N1: Permanent professors and similar positions	0	0	0
N2: Permanent EPST or EPIC researchers and similar positions	2	2	2
N3: Other permanent staff (without research duties)	2	2	2
N4: Other professors (PREM, ECC, etc.)	0	0	0
N5: Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	1	0	0
N6: Other contractual staff (without research duties)	0	0	0
TOTAL N1 to N6	5	4	4

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



- Detailed assessments

Assessment of scientific quality and outputs

The scientific output of the Team is correct, but could be improved. While the participation in several important publications with international author teams is appreciated (e.g. the *Nature* contribution on the *Ectocarpus* genome - IF 36.1), emphasis should be placed on “most important publications” derived from own activities – ideally in higher-ranking journals. In the last reporting period the papers that were ranked as most important by the unit had comparably low impact factors with only one paper listed in a journal with an IF > 5 (*New Phytologist*, IF 6.5). Other genuine contributions from the Team ranked lower. This is surprising since the quality of the introduced work is very high and it can be expected that in the close future major contributions will arise.

Assessment of the unit's academic reputation and appeal

The academic reputation of the Team is high. Several invitations to conferences demonstrate that the work is internationally recognised and that the progress is appreciated by the scientific community. The flagship project IDEALG leads to a strong integration into the French research community and boosts the appeal of the Team.

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

The implementation of the IDEALG project, the collaboration with local companies and the strong emphasis on the local and national outreach activities is remarkable.

Assessment of the unit's organisation and life

The organization is clearly structured, it fits into the new Unit and is very well linked with other activities of the Roscoff Biology Station (FR2424), be it the annotation activities in the *Ectocarpus* genome, the collaboration with protein crystallography, the outreach to the carbohydrate-Teams or the consequent adaptation of ecophysiological aspects to *Ectocarpus*. The Team intends to expand, which is also a recommendation by the committee.

Assessment of the unit's involvement in training through research

Doctoral students are encouraged to participate in international conferences, their activities in training programs could however be better supported and structured. The training of students on the master level could be intensified, especially since the work with e.g. algae in the field could attract students and motivate them to further pursue their training in biochemistry and ecophysiology.

Assessment of the five-year plan and strategy

The introduced concept of the Team is very good and combines the basic research questions with the emerging demands of the IDEALG project very well. The proposed projects reflect the state of the art and aim toward important contributions in several trans-disciplinary fields.



Conclusion

- Strengths and opportunities

The Team perfectly exploits the local natural resources by investigating stress responses of macroalgae. It dwells on the emerging tools of *Ectocarpus* as a model system by exploiting genome mining strategies in combination with a well-equipped metabolomics platform. The mission concept is clearly stated and embraces major explorative topics on macroalgal physiology and chemical ecology. The Team is the leading actor in the recently granted “*Investissement d’Avenir*” initiative IDEALG. This major funding resource will give the Team the possibility to develop further and incorporate also more applied aspects. The Team integrates very well in the new LIB2M Unit by using common resources (*Ectocarpus* genome, carbohydrate platform, protein crystallography...) and by offering expertise in the key technique metabolomics. The Team is active in the local and national outreach activities and especially well integrated in international collaborations. This is also reflected by several co-authored papers with international laboratories. Especially the close contact to Chilean researchers offers opportunities for not only transnational research but also for the development of concepts concerning the evolution of algal defense mechanisms.

- Weaknesses and threats

The publication record of the Team can be improved. There is a risk that acquisition and administration of big projects like IDEALG distracts the Team members from their scientific mission. The visibility in terms of scientific output should thus be increased. Teaching activities can be improved by implementation of master courses (e.g. ecological engineering, chemical diversity, etc.).

- Recommendations

The *Ectocarpus* metabolome project should be incorporated into the Team’s concepts. The implementation of the IDEALG project offers major opportunities for the generation of broader concepts from the ongoing seeding activities. Validation of emerging ecological implications of the physiological work in collaboration should be continued or even intensified.



Team 7 : Genomics of Vibrios

Name of team leader: Ms Frédérique LE ROUX

Workforce

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
N1: Permanent professors and similar positions	0	0	0
N2: Permanent EPST or EPIC researchers and similar positions	1	2	2
N3: Other permanent staff (without research duties)	0	1	1
N4: Other professors (PREM, ECC, etc.)	0	0	0
N5: Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)	1	1	1
N6: Other contractual staff (without research duties)	0	1	0
TOTAL N1 to N6	2	5	4

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



• Detailed assessments

Assessment of scientific quality and outputs

This recently created Team (start Sept 2010) focusses its research on vibrios infecting marine invertebrates. The main objective of this Team aims at obtaining insights in the mechanisms involved in the virulence of these vibrios. To achieve this aim, the Team will use a combination of population, comparative and functional genomic approaches, together with experimental pathology. In addition, they will focus on two pathogens that appear to use different mechanisms: *Vibrio nigripulchritudo* (a shrimp pathogen, model for mechanisms implicated in clonal expansion of virulent lineages with emphasis on lateral gene transfer (LGT)) and *Vibrio splendidus* (a sea urchin and oyster pathogen, model for virulence through action of communities). The Team has 14 publications of which 12 by the Team leader from previous research on vibrios in the last five years (2008-2012, three signed as first author and two signed as last author) and 2 by other team members from previous research. Six of the scientific papers were published in journals with an impact factor higher than 5, which is indicative of the potential of the Team to produce high quality research and to publish good quality papers: one in *Science* (IF 31), one in *PNAS* (IF 9.7), one (as first author) in *Nucleic Acids Research* (IF 8), three (two as first author) in *Environmental Microbiology* (IF 5.8).

Assessment of the unit's academic reputation and appeal

The Team has already initiated several national and international collaborations and part of the research was presented at conferences with an international audience. The Team has attracted important fundings from local and national sources including a 18 months support by the Brittany Region (Strategy of durable attractiveness, SAD Brittany 2010), an ANR grant (ANR blanc SVSE7 Vibriogen 2012-2015), which the team is coordinating, a 17 months IFREMER postdoc fellowship and a three years IFREMER PhD fellowship. In addition, the Team is involved as partner in an ANR EMBRC 2011 France project.

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

The Team gave a presentation to shrimp farmers in New Caledonia and has participated in a workshop on abnormal mortalities of oysters that was attended by representatives of the French oyster industry.

Assessment of the unit's organisation and life

The functioning of the Team is difficult to judge, as the Team is recent and small. The Team will expand in the near future and plans to interact with other Teams of the proposed LBI2M Unit through the use of their scientific and technical expertise and through research topics that can be performed in collaboration. The clearest interactions are with proposed Team 1 (project: "bald sea urchin disease") and Team 6 (project: "search for active antimicrobial compounds in micro-algae against vibrio").

Assessment of the unit's involvement in training through research

The Team is currently supervising one PhD student (since Dec 2011), has supervised a visiting Mexican PhD student (June-August 2012) and organized a conference for students of the Biological Station of Banyuls.

Assessment of the five-year plan and strategy

The project is well constructed and is expected to yield results that will help understand the mechanisms involved in virulence and resistance of vibrios infecting marine invertebrates. The results are expected to provide important information not only for the scientific community working on vibrio and enteric pathogens, but also beyond this (ecologists, the oyster and shrimp farming sectors, ...).



Conclusion

- Strengths and opportunities

The Team leader has previous experience with research on vibrio pathogens, which is necessary to successfully achieve the goals of this project. The Team has connections with researchers in and outside the Unit. Although it is clear that the Team will benefit from the scientific and technical expertise present in the proposed LBI2M Unit, it is necessary that the connections outside this Unit are maintained, to guarantee a successful outcome of the project.

- Weaknesses and threats

Besides the work on *Zobellia*, the proposed Unit has limited experience with marine bacteria and bacteria in general. In addition, vibrios are the research topic of many scientists, unlike the more “exotic” organisms studied by the other Teams. Although *Vibrio* research in the world focusses mainly on the human pathogens, there is an increase noticed in research on other vibrios, because of ecological (eg coral reefs) or economical reasons (oyster and clam industry, shrimp industry). This may have a negative (or positive) impact on this project.

- Recommendations

The Team is advised to monitor the *Vibrio* scientist community and the research topics they are working on. In the future, it may become necessary or opportune to enlarge their network and start new collaborations, or even modify certain parts of the project as proposed for the next five years.

The research topic of the Team is appropriate for the training of Master and PhD students and the Team is expected to be attractive for students. A moderate participation in teaching units of Master programs organised at the Roscoff Biology Station would certainly allow to promote the research topic of the Team in order to attract students to the laboratory and would increase the contribution of the Team to the training of students through research.



5 • Conduct of the visit

Visit dates:

Start: "17 December 2012", at "8:30 AM"

End: "18 December 2012", at "10:30 AM"

Visit site(s): CNRS, Hotel de France, Rooms 2 and 3, Roscoff, France

Institution: CNRS

Address:

Specific premises visited: (laboratories, platforms, support departments, etc.)

Conduct or programme of visit:

17 December 2012

8h30 – 8h50 : Closed-door meeting committee, presentation of the AERES by its scientific delegate

9h00 – 9h10 : Starting of plenary presentations, presentation of the evaluation committee, AERES

9h10 – 9h50 : Presentation of results and projects of the research unit by the unit director

9h50 – 10h10 : Questions to the unit director

10h10 – 10h20 : Break/ Debriefing of the committee

10h20 – 11h00 : Team 1

11h00 – 11h40 : Team 2

11h40 – 12h20 : Team 3

12h30 – 14h00 : Lunch / Meeting with representatives of Institutions supporting the unit (closed-door meeting)

14h00 – 14h40 : Team 4

14h40 – 15h20 : Team 5

15h20 – 16h00 : Team 6

16h00 – 16h10 : Break / Debriefing of the committee

16h10 – 16h50 : Team 7

17h00 – 17h30 : Meeting of the committee with technical and administrative staff

17h30 – 18h00 : Meeting of the committee with PhDs and postdocs

18h00 – 18h30 : Meeting of the committee with researchers

18h30 – 19h00 : Meeting of the committee with the head of research unit

19h00 : End of visit

19h00 – 19h20 : Debriefing of the committee

18 December 2012

8h30 - 10h30 : Closed-door meeting of evaluation committee (mandatory)



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

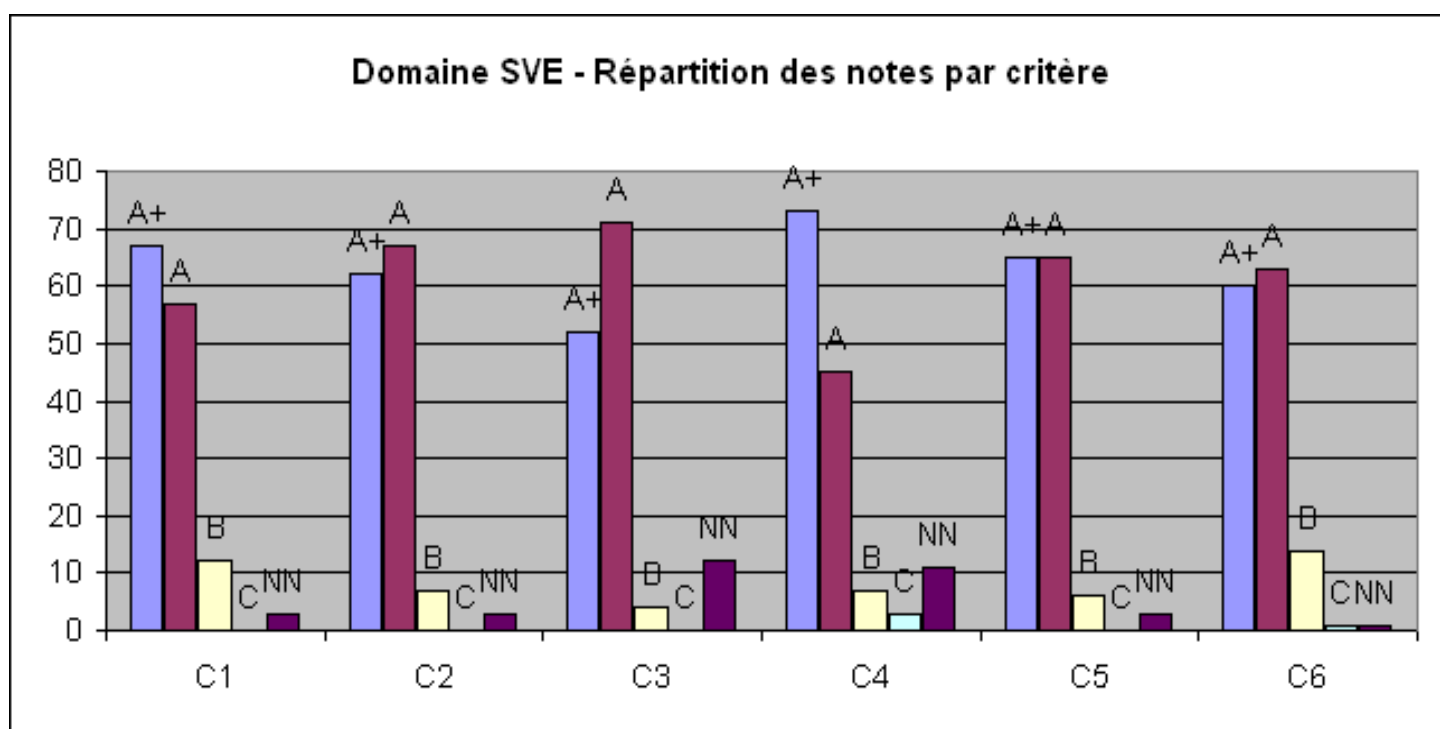
Grades

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 10 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 de laboratoire de Biologie intégrative des modèles marins, porté par Mme Boyen. 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 à la directrice du laboratoire. 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

