



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

Department for the evaluation of
research units

AERES report on the Research Federation:

Institute of Biology Paris-Seine

IBPS

Under the supervision of
the following institutions
and research bodies:

Université Paris 6 - Pierre et Marie Curie

Centre National de la Recherche Scientifique



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et de l'enseignement supérieur

Research Units Department

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Federation

Federation name: Insitute of Biology Paris-Seine

Federation acronym: IBPS

Label requested:

Present no.:

Name of Director
(2012-2013):

Name of Project Leader
(2014-2018): Ms. Catherine JESSUS

Expert committee members

Chair: Ms. Geneviève ROUGON, Institut de Biologie du Développement de Marseille-Luminy

Experts:

Mr. Jean-Christophe AUFFRAY, Institut des Sciences de l'Evolution de Montpellier

Ms. Laure BAILLY-CUIF, Institut de Neurobiologie; Gif/Yvette, (representative of CoNRS)

Ms. Hélène BARBIER-BRYGOO, Institut des Sciences du Végétal, Gif/Yvette

Mr. Mick CHANDLER, Laboratoire de Microbiologie et Génétique Moléculaire, Toulouse

Mr. Daniel CLESSE, Institut des Neurosciences Cellulaires et Intégratives, Strasbourg

Mr. Arnaud DUCHON, Institut de Génétique et de Biologie Moléculaire et Cellulaire, Illkirch

Ms. Joëlle DUPONT, Physiologie de la Reproduction et des Comportements, Nouzilly

Mr. André NIEOULLON, Institut de Biologie du Développement de Marseille-Luminy

Mr. Jean-Philippe PIN, Institut de Génomique Fonctionnelle, Montpellier

Mr. Massimo VERGASSOLA, Physics of Biological Systems, Institut Pasteur Paris

Mr. Alain JM VINCENT, Centre de Biologie du Développement, Toulouse



Scientific delegate representing the AERES:

Mr. Jean-Antoine LEPESANT

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

Mr. Paul INDELICATO, Université Paris 6 - Pierre et Marie Curie

Mr. Bernard POULAIN, INSB-CNRS



1 • Introduction

The site visit took place on March 19th, 2013. All committee members were present. Each committee member had received a report in English well ahead of the visit. This included the objectives, the proposed management and strategy, description of the history and performances of individual technical platforms in the last four years as well as the proposed projects for the « *Platform and Technology department* » and more generally the « *Institute of Biology Paris-Seine* » (IBPS). This report had been thoroughly prepared, contained all the information required by AERES and enabled an efficient preparation of the visit.

The visit opened by a closed-door session to prepare the review: the AERES delegates explained the AERES aims and strategy concerning « *Fédérations* ». Then, in an 45 min « open session », Ms. Catherine JESSUS and Ms. Jocelyne CABOCHE presented the achievements and projects for IPBS and the « *IBPS-Platforms and Technology Development* », respectively. The session was followed by a too short (45min) discussion between the committee members and the IPBS Steering Committee. Each of the 6 platforms as well as two group leaders applying to join the « *IBPS-Platforms and Technology Development* » presented their results and projects for 30 min. The committee also had a closed meeting with representatives from the Université Pierre et Marie Curie (UPMC) and INSB/ CNRS and another with the platforms' technical staff. At the end of the day, the committee discussed the evaluation of the overall IBPS project and prepared the final report.

Historical aspects of the Federation, geographical location of researchers and brief description of its field of activity

This "IFR" n°83 (Research Federation) was created in 1999 to provide a set of state-of-the-art facilities and scientific animation opened to the scientific community encompassing all biological disciplines, housed to the « Quai Saint-Bernard » UPMC site, as well as to promote scientific animation. The IFR was renewed in 2004 and 2009 and is directed by Ms. Jocelyne CABOCHE. Presently, this scientific community is composed of 11 laboratories/Units, 9 being part of the IFR, namely 3 CNRS and UPMC-partnered units (UMR 7322, UMR 7102 and UMR 7138), 1 CNRS, INSERM and UPMC-partnered unit (UMR S952/UMR 7224), 1 INSERM and UPMC-partnered unit (UMRS 839), and 3 UPMC units (ER 3, UR 4 and UR 5), addressing a wide variety of questions in the fields of neurobiology, developmental biology, biology of ageing, evolution, cell biology, adaptive and integrative biology. Six technological platforms (see below) have been equipped and run through the IFR coordination, transversal scientific animation had been promoted. Therefore, IFR 83 had fully fulfilled its mission. However, on one hand the IFR program will be discontinued by the funding agencies, and on the other, the visibility and attractiveness of the biological research developed on the site can be greatly improved. Aware of the situation, under Ms. Catherine JESSUS' coordination (presently head of the Developmental Biology Unit), in 2009 the biology community participated in a long brain storming period. The aim was to define an organization taking advantage of the strong human forces, the diversified competences and offering a better visibility of the discipline not only profitable to the actors but also to the entire UPMC university. This process, which lasted 3 years, led to the proposal of an Institute based on 5 thematic departments and 1 platform department. This re-organization, as well as the heads of the scientific departments, were approved by a vote of the entire staff. Briefly, the proposed organization is as follows: *IBPS-Neuroscience* (IBPS_N) - Director: Mr. Hervé CHNEWEISS ; *IBPS-Biological Adaptation and Ageing* (IBPS_B2A) - Director: Mr. Bertrand FRIGUET ; *IBPS-Developmental Biology Laboratory* (IBPS_LBD) - Director: Ms. Sylvie SCHNEIDER-MAUNOURY ; *IBPS-Evolution* (IBPS_Ev) - Director: Mr. Dominique HIGUET ; *IBPS-Computational and Quantitative Biology* (IBPS_CQB) - Director: Ms. Alessandra CARBONE ; *IBPS-Platforms and Technology Development* - Director: Ms. Jocelyne CABOCHE. Unfortunately, the institutions were not yet ready to support the creation of this large structure as a single partnered unit and recommended that the proposed departments be evaluated as independent UMRs. Five of the units/departments have been already evaluated by independent AERES committees which made their own recommendations. The present site visit was devoted to the evaluation of the *IBPS-Platforms and Technology Development*, and to that of the general strategy of the proposed Federation of Units: The Institute of Biology Paris-Seine (IBPS).



Management Team

Taking into account the present situation, two entities have to be considered: The IBPS as a “reinforced Federation” and the “IBPS-Platforms and Technology Development » department.

IBPS will be managed by a Director to be found; Ms. Catherine JESSUS who so far led the project through the planning phase, chairing a Steering Committee composed of the departments/units’heads, had applied and has been selected to occupy other prestigious functions. The director, should not be a director of one of the component research units, and the Steering Committee, will discuss and take decisions on IBPS internal matters and develop the Institute’s scientific strategy. Importantly, several of the prerogatives and but also duties of the unit directors will be delegated to the direction of IBPS whereas the same basic rules will apply to all units in order to avoid a return to a detrimental state of « compartmentalized structure ». The director and Steering Committee will be assisted by a statutory Laboratory Council, composed of various staff category representatives, advising the direction on internal matters. Moreover, a scientific advisory board (SAB) set up in 2011, composed of 21 external internationally renowned experts, provides independent evaluation and recommendations to the director and the Steering Committee. Members of the SAB will also participate in Search Committees for recruitment of new groups. A nearly finalized document, precisely defining the IBPS internal rules and functioning mode (budget, equipment, recruitment, human resources etc.) was sent to the Committee.

IBPS-Platforms and Technology Development: The structure will be directed by Ms. Jocelyne CABOCHE, herself part of the steering committee of the IBPS, who has acquired all necessary competences through directing the IFR and has shown great motivation and vision in her tasks. The director is in charge of the management of the department budget, decisions regarding equipment investment, and staff recruitment and careers. Each platform has a scientist from one of 5 units of IBPS as advisor. A specific users’ committees gathers one researcher from each unit together with the engineer in charge of the platform and its scientific advisor. The missions of these committees will be to favor scientific and methodological interactions, the formation of students and researchers and to anticipate investments.

Overall the mode of management appears well thought out and applicable to a large structure. Since IBPS will not be an Institute (UMR), a question specific for the *IBPS-Platforms and Technology Development* department is its official administrative structure. Although two research teams are applying to be part of it, its mission and way of functioning might well fit with that of an UMS (Unité Mixte de Service). This is an important question, considering the conditions necessary for financial autonomy. The question of whether a Department of the size and complexity of the *IBPS-Platforms and Technology Development* department should be lead by a research team leader from another unit, rather than by an independent director, could also be taken into consideration.

Own staff of the Research Federation

The IBPS includes in total about 600 staff members among which 350 have permanent positions depending on 3 institutions. These include 194 researchers (62 CNRS, 30 INSERM, 102 UPMC professors or assistant-professors) and 67 technical staff attached to the teams (31 CNRS, 8 INSERM, 28 UPMC). In addition, the 5 participating units have “common services” independent of the department below, which comprise 44 technical staff (13 CNRS, 2 INSERM, 29 UPMC).

The “Platforms and Technology Development department » is composed of 34 people. It has a total of 34 affected technical staff : 8 from CNRS, 18 from UPMC and 7 researchers from UPMC.



2 • Assessment of the federative structure

Overall opinion

The IFR 83 had fully fulfilled its mission since, as several other successful IFR in the French landscape, it is at the initiative of the creation of a larger and more integrated structure with a defined administration method and identified scientific objectives. This success laid the conditions for the IBPS creation. Thanks to the motivation of the entire biology community and the energy and vision of the present leader Ms. Catherine JESSUS, a considerable effort of restructuration had already been achieved. All the participants should be congratulated as it is clear that the undertaken remodeling is vital to the visibility and competitiveness of this large community and to a better exploitation of its assets. The concrete result is the gathering of about 60 groups arising from 11 former laboratories within only 5 Units and the elaboration of collegial management strategies.

The committee noted that IBPS as a whole entity has several assets including (a) the very well equipped "Platforms and Technology Development department" endowed with competent personnel, central to the IBPS scientific activity, (b) a broad range of competences encompassing several scientific domains generally dealing with the dynamics of living organisms, (c) the mastering of a rich variety of models as well as complementary methodological approaches, (d) of note is the participation of the « High throughput data analysis for functional genomic » team as well as that of the *IBPS-Computational* and Quantitative Biology (IBPS_CQB) unit that will provide the mandatory competences (genome-wide approaches, bioinformatics tools, modeling of complex biological systems etc.) needed to address and solve timely biological questions. However, IBPS also faces several problems which must be solved to maintain the very positive dynamics noted and encouraged by the committee. The priorities are: (a) the identification of a new leader, (b) putting into every day practice the principles defined by the Steering Committee and personnel, (c) stimulating exchanges and collaborations and increasing the visibility the whole structure not only locally but also internationally, (d) finding space on site for the *IBPS_CQB* unit, and e) finalizing the realization of animal facilities.

Strengths and opportunities

Appreciations are given for IBPS ; points pertaining more specifically to the « Platforms and Technology Development department » are detailed below.

Local positioning : IBPS can beneficiate from the interdisciplinary environment within the Jussieu site but also from the proximity of the UPMC medical faculties (Pitié-Salpêtrière, Saint-Antoine, Tenon, Trousseau, Vision Institute) as well as that of neighboring prestigious Institutes such as Collège de France, Ecole Normale Supérieure, Curie Institute, etc.).

The strong community spirit and the collegiality of management. The adhesion of the units' leaders and personnel to an already well defined mode of functioning with established priorities and strategy (recruitment, space, budget etc.) owing to the vision and efforts of the present leader.

Strong human resources: with (a) a high level of technical staff with permanent positions (compared to other French institutes). (b) a central position in shaping the biological research of UPMC, through the participation of its staff to teaching and tutoring activities (Participation in undergraduate, Masters and PhD training programs)

Already well organized platforms, with competent and motivated technical staff and people in charge, that cover most of the needs of the research groups. The integration of the competences of S. Le Crom's team in the "Platforms and Technology Development" department to guide researchers in the choice of the sequencing technology and in data analysis appears as a major addition to the IBPS.

Very significant level of funding from external sources raised by the partners for the shared equipment.



Weaknesses and threats

The major threat is the departure of the present leader who is respected and trusted by the whole community and the risk of demotivation of the personnel perceived through the discussions with the technical staff of the platforms if their efforts become affiliated with the UPMC as a whole rather than with IBPS. Indeed, the IBPS scale and collegial spirit allows them being in direct contact with individual research projects, hence permits dedicated technological developments in addition to providing service activities.

Some aspects of the project concerning scientific integration are still immature and should be taken into consideration to guarantee the success of merging in an « integrated Federation ». In particular, scientific interactions between the different entities need to be developed prior and after merging. Units should start without delay joint scientific “brain storming” seminars. For example, strengths of the IBPS-CQB should be better defined and integrated and team leaders should clearly show how they want to capitalize on them.

The poor condition of the animal facilities, the ongoing real estate rehabilitation whose duration appears uncertain and this will seriously impair scientific projects.

Recommendations

The present leader, Ms. Catherine JESSUS, should be commended for developing a new model for research within the Jussieu site in the context of the history of UPMC and its tradition in teaching. IBPS is an original structure within UPMC that takes full advantage of the scientifically competent and large human forces to promote interdisciplinarity, intellectual stimulation, new synergies. Full support of the community to Ms. Catherine JESSUS’s leadership in building this new structure, could be noticed during the visit. To strengthen the IBPS structure and its continuity in the next term, the committee feels that it is essential and urgent to identify a new director. The committee suggests privileging the choice of an experienced personality, approved by the IBPS staff, able to run but also promote the structure to ensure its external visibility. The committee feels that a « rotating direction » involving units heads would not be satisfactory in the long term. A general recommendation to alleviate administrative work, would be to create a position for a « secrétaire general » or for an administrative assistant with a research background and able to manage human resources (see also below).

The committee strongly supports the strategy of reorganization that has been undertaken. A first important step to ensure the visibility and international recognition of the site has been accomplished by structuring units/departments. Putting into every day practice the principles and priorities defined by the Steering Committee and personnel is the following step. It is absolutely essential to push forward and put this already outstanding integration program. Delays would place the entire structure in danger. The committee strongly encourages the different members to continue in the same direction, despite the difficulties they may have to solve.

The current plans for the administrative organization of IPBS will offer major improvements in the management of careers for individual staff, notably their possibility to relocate within IBPS depending on needs or personal interests. It is crucial that this possibility is coordinated at the scale of IBPS as a whole, and it should be backed up by the creation of a central “contact point” managing human resources.

The IBPS project needs full support from all institutions. IBPS should be helped to finalize the installation of animal facilities, which include importantly the aquatic model facility and in raising additional funds for the equipment of the rodent facility. Ultimately, having the entire IBPS within a single site would be ideal to exploit the complementarities. The priority should be to relocate the *IBPS-CQB* to the Quai St-Bernard.



3 • Detailed assessments

Cellular Imaging Facility

Scientific activity generated by the synergistic action of the research federation:

The Cellular Imaging Facility (CIF) is under the responsibility of Dr S. BOLTE, with the support of three engineers with permanent positions. This staff has expertise in routine and live cell imaging, flow cytometry and cell sorting and image analysis. It has also experience in more complex F-techniques, FRAP, FLIM and FRET. New, state of the art equipment has recently been purchased, including two new confocal microscopes in 2011, one dedicated to fixed samples and one to photon counting, a new multiphoton microscope, two multilaser cytometers, and a second spinning disc device. Fund-raising for a Spinning disc confocal with FRAP and a macro-confocal is well engaged, for purchase in 2013/2014.

Reality and quality of scientific animation:

In order to maintain its objectives as an IBPS platform, the CIF relies on two scientific councils (imaging and cell sorting) with representatives of all IBPS units. This is a very important aspect in the coming period.

In terms of methodological development, the CIF collaborates with, and benefits from the expertise of the project "Cellular Modeling and Biological Imaging", in particular in software Image J development (financing of one master student per year).

Relevance and quality of common technical services/Reality and extent of the pooling of resources units:

The sharing of state-of-the art equipment by all IBPS units and involvement of 4 engineers allows the CIF to respond efficiently (and largely anticipate) the diversity of needs expressed by IBPS teams studying various model organisms, in both terms of training and methodological development. So far, the online booking system (CNRS patent) has shown no sign of saturation of the platform.

Valorization of research results:

CIF has been acknowledged in 58 publications since 2007.

Relevance of the strategic scientific project, complementarity / integration with respect to other federal structures locally present on this site:

The CIF is integrated into two UPMC platform networks which coordinate fund-raising. The CIF is also member of the European Cytometry Network. In addition to IBPS members CIF provides cytometry and confocal microscopy training to Master students, students from 4 Doctorate schools and participates in "Formation permanent" in CNRS, INSERM and UPMC programmes. This contributes to good local visibility of the CIF platform.

In conclusion, the CIF is undeniably an added value of IBPS. Maintaining financial autonomy within IBPS and privileged links with IPBS teams is essential.

One CIF objective, for the next period, should be to reinforce networking with other imaging platforms in nearby Research institutes, including those affiliated with the France-BiImaging program and obtaining a GIS-IBISA label in order to stay front-line in imaging techniques and increase its national visibility.



Electron microscopy facility

Activity generated by the synergistic action at the research federation :

The electron microscopy facility (EMF) platform is under the responsibility of an IR2 CNRS and involves one more IE and two AI (1 CNRS and 2 UPMC) all with permanent positions. The staff is recognized by its great expertise in routine electron microscopy analysis and therefore develops long term collaborations with more than 10 teams. These collaborations lead to excellent publications co-signed by the members of EMF platform or more frequently in papers acknowledging them. The EMF platform contributes to new technological developments to adapt the methods to scientific constraints of the new projects. Interestingly enough, EMF platform is also characterized by its expertise in cryomethods. Indeed such methods are now the apanage of very few groups in France and the EMF platform of the IBPS is certainly one of the most expert group in this very special field of ultrastructural analysis. Moreover EMF is a leader group in developing analysis at a great scale imaging until the nanometer scale.

Reality and quality of scientific animation :

As mentioned above the EMF platform is involved in methodological developments to adapt the ultrastructural imaging methods to new materials and preparation brought by the research groups. Contributing to updating the methods and adapting the technics to the scientific projects is a responsibility for EMF and in this way they are currently acting to upgrade the technologies. Such technological updatings are therefore under the responsibility of people which are expert in the field. They contribute in this way to some networks in the UPMC and also linking some of the EM platforms at the level of Ile de France area and at the national level. The EMF platform is involved in organizing local and national training of people interested in developing EM technologies (formation continue).

Relevance and quality of common technical service :

The EMF platform has a great widely recognized expertise in ultrastructural imaging. The platform is currently managing projects in the field of conventional EM and more specialized cryomethods. The contribution is not limited to the members of the IBPS although the teams of the institute constitute the main users of the platform. Altogether the ressources in technicians appear to be presently insufficient and the EMF platform asks for reinforcement. Moreover it is emphasized that part of the equipment is more than 15 year old and necessitates some renewing. In this respect it is worthnoting the direct involvement of the EMF platform in contributing to money raising for further equipment renewing to give access to more sensitive analytical methods.

Reality and extent of the pooling of ressources unit :

Because of a certain renewal of the interest of biology for EM due to actual very performant developments (high resolution in scanning EM coupled to cryomethods, correlative light scanning or transmission EM, etc.) including analysis at the nanoscale, there is an increase in the demand and the platform could be considered as obviously underdimensioned at the level of the university.

Valorization of research results :

EMF has contributed to a great number of selected publications within the last four years attesting for its key role in numerous research projects.

Relevance of the strategic scientific project, complementary/integration with respect to other federal structures locally present on this site :

EMF platform was involved in correlative light EM (CLEM), EM tomography and cryo-tomography projects. Recently it was involved in development of CLEM to correlate observations of the dynamic processes relative to high resolution surface topology with the ambition to characterize subcellular structures in EM tomography. Such a project will involve different teams of the IBPS and certainly different institutes at the level of the university and over.

To conclude, the EMF is a highly performant on site platform. People working at the EMF platform are highly responsible and very motivated for developing new ultrastructural methods for research. They have shown in the recent period their involvement for money raising to optimize their equipment for contributing to the most performant methods in the description of anatomical and functional organization at the EM level.



Rodent Facility

Activity generated by the synergistic action of the research federation:

The rodent facility houses mice and, to a lesser extent, rats that will be used by different units of the future IBPS. It is undoubtedly a key asset to the production of the scientific teams: at least 30 groups use rodent models covering research areas like neurosciences, physiology and physiopathology, and developmental biology. This animal's facility is crucial for the institute and increasingly solicited by users. Consequently the number of transgenic lines hosted has doubled in 5 years to reach nearly 200 in 2011, leading to a permanent evolution.

Reality and quality of scientific animation:

A steering committee meets regularly to discuss the organization of the platform. This committee is composed of the facility director and 2 designated members of each laboratory, and it ensures a connection between the animal house platform and the different units.

Relevance and quality of common technical services:

The rodent platform consists of two structures, a main one (area 500m², 144m² for housing, 2.500 cages) is located on the 8th floor of the building Quai St Bernard. This facility is more specifically dedicated to breeding and crossing of the transgenic mouse lines, under strict health status. The second is smaller (area 75m², 24m² for housing, 200 cages), located in the same building and under less restrictive health status. It is dedicated to the animals under experimentation. In addition, a few small rooms exist in some research laboratories. The team consists of 10 people including only 5 on fixed term contracts.

The platform is evolving since 2007, with a gradual increase in demand for accommodation, thereby increasing the accommodation area, staff and necessitating an evolution in the organization. However, despite all efforts, the platform is undersized and non-compliant at several levels.

Valorization of research results:

The platform is also involved in the UPMC small animal phenotyping network (RPPA). However, considering the extent of the future animal facility, it might benefit from joining a national network for accommodation and use of transgenic animals.

Relevance of the strategic scientific project, complementarity / integration with respect to other federal structures locally present on this site:

The facility plays a crucial role in the research programs of numerous groups using rodent models. It is crucial for the facility to be maintained at the highest level with the latest state of the art technology. This requires a complete overhaul and the construction of a new building, to meet current standards in the field. This project is expected to meet the demands of research teams by increasing the accommodation capacity (area 900 m², 3.800 + 1.400 cages) and facilitating the working conditions of the staff while staying in accordance with ethics and animal welfare. Part of the financing plan is already accomplished, in particular for construction of the building, but funding for equipment has yet to be finalized.

The platform leader is on a fixed term contract. Given the importance of the proposed development, it appears essential to perpetuate this position. Moreover, it therefore appears necessary to evaluate the new workload and cost accordingly.



Aquatic Models Facility

Activity generated by the synergistic action of the research federation:

Aquatic facility equipment is currently spread over several distinct rooms, associated with the main users' teams. It comprises: (i) a 50 m² fish facility of 490 tanks, hosting around 4.200 growing and adult zebrafish, as well as representatives of other fish species (cichlids, Polypterus, Protopterus), (ii) set-ups for maintaining amphibian species (*Xenopus laevis* and *tropicalis*, *Pleurodeles*, *Axolotl*), (iii) set-ups for maintaining ascidians, cnidarians and ctenarians. In addition, one egg injection device is available, and several others are available within teams. Collaborative work and the recruitment of junior research teams recently extended the use of these models, notably zebrafish and ascidians, whether for developmental biology, neurobiology or evolution studies. To date, 9 teams across the three Units Developmental Biology (S. SCHNEIDER-MAUNOURY, DL SHI, M. UMBHAUER/JF RIOU, C. JESSUS, K. WASSMANN, V. GALY) Neuroscience (J. HAZAN) and Evolution (M. MANUEL, J-Y SIRE) are using aquatic models and the demand in animal numbers and space is steadily increasing. Use of these models is central to the scientific achievements of these 9 teams and a strong motivation for scientific collaborations and exchanges between the three relevant IBPS Units. A reorganization of these aquatic set-ups into a single, central aquatic facility is one of the major new proposals of the IBPS "Platforms and Technology Development" Department (see below).

Reality and quality of scientific animation:

At present, two UPMC staff technicians are taking care of zebrafish in close collaboration with the three user teams and under the coordination of an engineer from the SCHNEIDER-MAUNOURY team. Other models are maintained on a team-by-team basis. Although the work done is of high quality and supports the scientific projects at its best, the current fragmentation of the different aquatic set-ups prevents the centralization of needs, trainings and animation.

Relevance and quality of common technical services/Reality and extent of the pooling of resources units:

In addition to being fragmented over several teams, the overall equipment is currently largely undersized, and does not meet modern standards in several instances, notably for amphibians. The optimization of this equipment and its organization into a single, dedicated space would greatly help coordination and save work force to support the scientific projects.

Valorization of research results:

There is no research directly performed by the current aquatic facilities, but it is obvious that these facilities are key to the work of their users teams. The zebrafish facility, the only entity existing as such at present with dedicated staff, is acknowledged on several publications during the last 4 years.

Relevance of the strategic scientific project, complementarity / integration with respect to other federal structures locally present on this site:

Creating a larger, state-of-the-art and centralized "Aquatic Models Facility" is mandatory for the success of IBPS and responds to absolutely real and severely urgent needs from both the working groups and the Institute: (i) to have enough space and animals to develop the currently funded and future research projects of existing teams, (ii) to modernize outdated and poorly performing equipment, (iii) to facilitate the coordination of needs, (iv) to capitalize on the existing resources and expertise of the different groups using aquatic models and enhance the overall technological potential available for each individual team, and, overall, (v) to open the possibility of recruiting new teams working with aquatic models. Pooling the existing human resources should provide enough support to run this facility on a day-to-day basis, but recruiting an Engineer in charge of coordinating activities will be strongly needed. The working groups have gathered a large amount of the necessary funds for equipment through a number of national, regional or local calls. Dedicated space (350 m²) has been identified and plans for the future facility are ready. This space however needs refurbishment, but the initial commitment of UPMC on this point has not been met to date. In addition to threatening all research projects, this poses a real risk of losing the already collected funds for equipment, which need to be spent before the end of 2013. The committee unanimously recognized the dramatic impact of such a scenario on the working groups and the success of IBPS as a whole and urged UPMC to move forward and, as a first step, conduct a detailed estimation of the refurbishment costs.



Protein engineering and real-time PCR

Scientific activity generated by the synergistic action of the research federation:

The Protein engineering and real-time PCR platform, headed by C. PIESSE, is composed of three services managed by UPMC engineers. The peptide synthesis service produces a variety of peptides on demand, including post-translational modifications, peptides being supplied with a mass spectrum and an HPLC profile. This service has achieved 278 peptide syntheses in the period, and has also established collaborative projects on the study of anti-microbial peptides and of chemokines. The Biomolecular interaction service proposes studies of label-free and real-time interactions between every type of biological molecules (protein, lipids, nucleic acids) in a simple or complex environment, based on the surface plasmon resonance technique (Biacore 300 instrument). Twenty four projects have been completed, including collaborative projects on anti-microbial peptides and the growth hormone gene. The Real-time PCR service is mainly used for the quantification of gene expression (1.728 runs).

The platform resources have evolved significantly since 2007, with the recruitment of two engineers and the acquisition of new equipments (Biacor 3000, HPLC, Light Cycler 480, capillary electrophoresis), which allowed to improve and widen the activities.

Reality and quality of scientific animation:

Only the Biomolecular interaction service has set up a user committee which meets once a year to discuss potential improvements of the service.

All three services participate in training sessions of Master students from UPMC.

Relevance and quality of common technical services/Reality and extent of the pooling of resources units:

The three services of the platform show various degrees of openness to external users. The Real-time PCR service is essentially used by "in-house" teams (90 % of users), whereas the Peptide synthesis service has 50 % of internal users and 50 % users from other UPMC laboratories. Half of the Biomolecular interaction service users also belong to the constitutive units but 37,5 % come from academic units outside UPMC.

The Protein engineering and real-time PCR platform relies on the Mass spectrometry and proteomics platform for its activity of peptide synthesis (verification of peptide integrity), and plans to collaborate with the CIF and Electron microscopy facilities for the development of labeled peptide-ligands suitable for fluorescence and electron microscopy.

Valorization of research results:

Since 2007, the engineers of the platform co-authored 7 publications and the platform has been acknowledged in 10 publications.

Relevance of the strategic scientific project, complementarity / integration with respect to other federal structures locally present on this site:

The Protein engineering and real-time PCR platform plans to acquire a new automated peptide synthesizer but no mention is made of possible funding sources. The project focuses on already established collaborative projects inside or outside UPMC, but service activities will have to be maintained as well. A good equilibrium between the two types of activities (service/collaborative projects) and a strong networking with IBPS teams and other IBPS platforms are both required for a good visibility of the platform inside and outside IBPS. A better coordination between the three services which appear rather independent (for instance via the creation of a common user committee) would also strengthen the platform visibility.



Mass Spectrometry and Proteomics

Scientific activity generated by the synergistic action of the research federation:

The platform is composed of a CNRS Research Director, a assistant professor, an engineer and a assistant engeneer in addition to a second year graduate student. The activities are overseen by a three-member committee composed of platform users (two from the future IBPS and one from the Chemistry faculty) in addition to the team members.

The Mass Spectroscopy and Proteomics Platforms serves the needs of both biologists and medical researchers in the study of peptides and proteins. It is one of three independent installations on the various UPMC campuses. The others are specialised in analysis of lipids and biomarkers respectively and are not part of the future IBPS. The platform is well equipped including the "Orbitrap technology", which is among the most recent technology in mass spec. The facility assures routine qualitative and quantitative analyses of between 500 and 900 samples a year. 50-30% are part of collaborative projects and 25% are research projects specific to members of the platform staff. The remainder represents services to the community.

Reality and quality of scientific animation:

The academic staff are involved in two Masters programmes and the entire staff contribute to training programmes in the use of MALDI-TOF on the UPMC campus and in national training programmes of the CNRS, INSERM and INRA.

Valorization of research results:

The academic reputation of the platform can be judged by the number of fruitful collaborations solicited and by the number of publications which result (19 since 2007).

The scientific output measured in publications is good. Members have 25 publications since 2007 including 6 signed uniquely by members of the group. They are also invited to international and national meetings to present their work orally and in the form of posters.

Relevance and quality of common technical services/Reality and extent of the pooling of resources units:

The platform appears well equipped for purpose and functions in an efficient way. It attracts and will continue to attract projects from the IBPS. In addition to continuing the Mass Spectrometry service, the platform proposes in the short term to continue its studies on post-translational protein modifications (phosphorylation methylation) using IIf3-NF90 and the small Ap-B as models (both as collarorations within the IPBS) and the identification of protein partners of various peptides. It will continue collaborations on quantification of oxo-guanine in plant extracts (IBPS) and vitamine dosage (UMR7625, UMR7204, UMR7618). It has a long term project involving the development of Mass Spectrometry as an imaging method. The committee was aware that this application is far from routine and will require considerable effort to develop.



4 • Team-by-team analysis

Team 1 : Biogenesis of Peptidic Signals

Name of team leader: Mr Thierry FOULON

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	6	3	3
N2: Permanent EPST or EPIC researchers and similar positions			
N3: Other permanent staff (without research duties)	2		
N4: Other professors (PREM, ECC, etc.)	2	2	2
N5: Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)			
N6: Other contractual staff (without research duties)			
TOTAL N1 to N6	10	5	5

Team workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	3	
Theses defended	6	
Postdoctoral students having spent at least 12 months in the unit	1	
Number of Research Supervisor Qualifications (HDR) taken	10	
Qualified research supervisors (with an HDR) or similar positions	1	1



• Detailed assessments

Assessment of scientific quality and outputs

This team was originally composed of 2 Pr, 4 MCU and 5 technicians. It originates from a larger group from which 9 people left (3 retired). The main research topic is signaling peptides, from their identification, the determination of their structure-function relationship, to their biological significance. Four main projects were pursued: 1) characterization of an angiotensin converting enzyme from crayfish, 2) study of the crustacean hyperglycemic hormone, 3) the aminopeptidase B (Ap-B) and its bifunctional activities, and 4) the identification and characterization of antibacterial peptides from the amphibian skin (Temporins). The first two projects were terminated in 2012. The main findings of topic 3 are: i) the identification of cathepsin L endopeptidase as a partner of Ap-B; ii) identification of new roles of Ap-8 such as antigen processing; and, iii) establishment of the substrate specificity of Ap-B. For topic 4, the main results are: i) the structural characterization of several antimicrobial peptides; and, ii) identification and characterization of several temporins, active against multi-resistant bacteria. While each one of these projects is in itself fascinating and should produce interesting results impacting both science and public health, each also requires a major research effort.

In total, this group produced 24 original scientific publications in good journals (JBC, FEBS J, Peptides, Biochemistry), 7 review articles, 8 review articles in which group members are co-authors, 2 patents, and 2 book chapters. Such a scientific production represents a good activity for a group exclusively composed of university professors (PR) and junior faculty (MCU) with heavy teaching duties and responsibilities. However, one should take into account the number of technicians working full time in the unit, as well as the 6 graduate students who have been trained since 2007.

Assessment of the team's academic reputation and appeal

The academic reputation and appeal remains limited. The unit established a number of collaborations with laboratories both in Paris, and within France, but also in Germany and the USA (Boston and San Diego). Members have participated as experts in a few evaluation committees such as AERES and the National Council of Universities (CNU, section 64). One member was invited to an international meeting (in Japan). The group has not yet succeeded in raising enough funds to attract post-doctoral fellows, nor has it attracted researchers with full time activity in research.

Assessment of the team's organisation and life

The group decided to terminate one program, a good decision likely related to the retirement of some members of the team. But in view of the increasing competition in this area, it is important to limit the number of research programmes to be able to reinforce and improve the quality of those being carried out with the available resources.

The group received limited grant support. It is a partner in only one important grant (ANR), and this concerns a topic different from the main projects of the team. This is surprising since many of the programs are of high interest both from a scientific and public health perspective (antimicrobial peptides, discovery of new biologically active peptides,).

Assessment of the team's involvement in training through research

Since 2007, eight graduate students have been trained in the team and have successfully defended their PhD. It will be important to know what the young scientists are doing now. No post-doctoral fellows have been trained in the group, due to lack of funding. The group is also involved in training BTS, licence Pro and Master students. The number is 20 since 2009. This nicely illustrates how attractive a group composed of Pr and MCU can be for young students.



Assessment of the five-year plan and strategy

The proposed project is based on the continuation of the two previous programs (Temporins and Ap-B), with the initiation of a third dedicated to the characterization of tickorphins and their possible therapeutic application as analgesics in pain treatment. The temporins project is important due to the therapeutic potential of these new microbials, especially considering the increase in abundance of multi-resistant bacteria. The peptides also appear active against yeast protists such as *Leishmania* at doses which are below the cytotoxicity levels of the mammalian host. This later program opens new funding possibilities typically including industrial partners. The program is based on the basic technical expertise of the team, and on collaborations with other groups.

Conclusion

- Strengths and opportunities:

The group has a strong expertise in biological peptide studies, from their characterization, structure resolution, manipulation, purification. This group is recognized for its work on the peptides produced by the amphibian skin, as a source of potential new therapeutic agents. The research program concentrates on the most promising peptides, such as those with microbial activity, and others with possible analgesic effects. Such programs should be of interest to raise funds from the industry, and from grant agencies, as partners of collaborative studies.

The "peptome" from the amphibian skin is likely to contain many interesting peptides with biological activities, as already well identified in many venoms from snakes, snails or arachnids. It would be of major interest to organize these peptides into fractions for screening purposes. Such an approach may help the group to better integrate with other teams from the IBPS UMRs, if active peptides of interest to these other teams are being discovered.

The biological actions and mechanism of action of the identified peptides should be better characterized.

- Weaknesses and threats:

The group suffers from a lack of grant support, limiting the development of the projects carried out despite their interest for basic knowledge and in therapeutic applications. This also limits the attractiveness of the team.

Too many programs are being carried out relative to the manpower within the team. This limits the success of risky and potentially high reward projects.

This team appears isolated scientifically. It is mostly connected to technological platforms within the IBPS federation that they are using, rather than to other scientific teams that share related interests. This is particularly important considering that their main goals are not technological, but conceptual.

Within the IBPS federation, this team is presented as a team developing technologies for the research teams of the associated research units. However, the main goal of the project is not technological development, but rather scientific projects. It is also not made clear which team within the UMR will benefit from the technological development the team is carrying out for its own programs. Such a positioning of the team is not clear, and contrast with the other team within the IBPS federation.

- Recommendations:

The team should be more ambitious. Major efforts should be carried to raise funds from industry or grant agencies. The projects lend themselves perfectly to outside funding. The development of novel antibiotics, and novel analgesics is very promising. The knowledge of the team regarding the "peptome" from amphibian skin is of great interest for identifying possible novel therapeutics. This could be better organized. The number of research projects should be limited, and prioritized. An effort should be made to investigate the detailed activities of the active peptides and in the long term to relate these to their structures. It is essential to have a detailed understanding of their activities and a significant effort should be directed towards this goal either "in-house" or via active external collaborations.



Team 2 : High Troughput Data Analysis for Functional Genomics

Name of team leader: M. Stéphane LE CROM

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	1	2	2
N2: Permanent EPST or EPIC researchers and similar positions			
N3: Other permanent staff (without research duties)			
N4: Other professors (PREM, ECC, etc.)			
N5: Other EPST or EPIC researchers (DREM, Postdoctoral students, visitors, etc.)			
Other contractual staff (without research duties)			
TOTAL N1 to N6	1	2	2

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	1



• Detailed assessments

Assessment of scientific quality and outputs

The leader of the team has a strong record as the head of the Montagne Sainte Geneviève (MSG) genomic platform at ENS and started the associated team at IBPS in September 2011. A number of high-quality microarray and sequencing data have been produced and analyzed, which led to the publication of 35 peer review articles in well-recognized international journals during the period 2007-12. The majority is in collaboration, nine of them having members of the team in the first or last position of authorship.

Assessment of the team's academic reputation and appeal

The IBPS team and the MSG platform are well known and have an excellent reputation both at the national and European level. Their location is ideal to stimulate collaborations and interactions. National labels add to the reputation and the wide visibility of the team.

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

The MSG platform at ENS and the associated IBPS team have strong and diverse contacts and connections with the scientific environment and the institutions around Montagne Sainte Geneviève and the Paris area in general. Furthermore, they have numerous collaborations with European groups.

Assessment of the unit's organisation and life

The double affiliation of the team leader does not seem to impair the activity of the group and actually seems a positive feature that allows diversification. The geographic proximity of the platform ENS and IBPS simplify the joint organisation and common activities.

Assessment of the unit's involvement in training through research

The team is strongly involved in training. During the 2007-12 period the platform has trained more than 500 researchers and students and the team leader is in charge of various courses and teaching programs.

Assessment of the five-year plan and strategy

The strategy of developing a strong team with competences in genomic data analysis and keeping the coupling with the data-producing ENS platform is well thought, timely and realistic.

Conclusion

• Strengths and opportunities

The combination of data production and analysis is a strength and a great opportunity for the quality of genomic activities.

• Weaknesses and threats

The IBPS team should pay attention to having sufficiently independent scientific activities and projects so as to justify its "equipe" status, which is certainly useful for certain aspects but could strike back during evaluations and assessments of the group.

• Recommendations

It is a project to be fully supported and developed as described in the project, with the only caveat of paying attention to the potential threat mentioned above.



5 • Supervising bodies' general comments

Paris le 28 08 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 l'Institut de Biologie Paris – Seine. Nous tenons à remercier l'AERES et le comité pour la qualité du travail d'analyse qui a été conduit.

Ce rapport a été transmis au comité de direction de l'Institut qui nous a fait part en retour de ses commentaires que vous trouverez ci-joint. Nous espérons que ces informations vous permettront de bien finaliser l'évaluation du laboratoire.

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



Institut de Biologie Paris-Seine

Response of the Steering Committee to AERES report on IBPS 27/8/2013

Response on the management team, p5.

« The question of whether a Department of the size and complexity of the *IBPS-Platforms and Technology Development* department should be lead by a research team leader from another unit, rather than by an independent director, could also be taken into consideration. »

We believe that the director of the department has to keep a research activity in order to stay in a close contact with the laboratories. The way we believe that the direction can work is to get a co-leading from a director and an assistant director.

Response on the search for a new IBPS director.

Recommendations, P8 : « The committee feels that it is essential and urgent to identify a new director. The committee suggests privileging the choice of an experienced personality, approved by the IBPS staff, able to run but also promote the structure to ensure its external visibility. The committee feels that a « rotating direction » involving units heads would not be satisfactory in the long term. »

The AERES committee visit took place shortly after Catherine Jesus was appointed to the direction of the CNRS – “Institut des Sciences Biologiques”. Since then, the IBPS Steering committee thoroughly discussed the question of the new director and had a similar opinion to that of the AERES committee. A long term rotating direction was excluded. The search for a new director, either internal or external, is underway.

Recommendations, P8 : « A general recommendation to alleviate administrative work, would be to create a position for a « secrétaire general » or for an administrative assistant with a research background and able to manage human resources (see also below). »

An administrative assistant position for the director has been appointed from October 2013.

Response on the “Rodent Facility” p11 and to “Weaknesses and threats”, Point 3, p8

Fund for equipments have started to be raised by the researchers with funds from the region Ile-de-France, but also from the UPMC and the Institutions (more than 1.1 million euros). Efforts will continue in the future. A new building, funded by Epaurif (Etablissement Public d’Aménagement des Universités d’Ile de France), is scheduled for 2014-2015

Response on the “Aquatic Models facility” p12 and to “Weaknesses and threats”, Point 3, p8

Since the AERES committee visit, UPMC released the funds required for refurbishing the aquatic facility. This refurbishing has been scheduled for 2014 by the “Direction du Patrimoine Immobilier” department. The acquisition of the equipment will also take place in 2014, and the facility should open late 2014 or early 2015.

Response on CQB

p.7, paragraph “Overall opinion”, “Quantitative Biology (IBPS_CQB) unit that will provide the mandatory competences (genome-wide approaches, bioinformatics tools, modelling of complex biological systems etc.) needed to address and solve timely biological questions.”

We want to emphasize that A. Carbone’s unit, as a unique research unit gathering mathematicians, physicists, computer scientists and biologists, will above all bring to the IBPS new fields of research and innovative approaches to biological questions. Its main contribution to the IBPS scientific life will thus be conceptual rather than methodological and therefore, is far from providing services in data analysis or in methodology development. Nevertheless, collaborations will be envisaged. As already mentioned in the AERES document of the UMR CQB, there will be an effort in integrating new teams in CQB that will foster the interactions on research topics of interest to the unit and to the IBPS, on methodologies (anchored in mathematics, physics and computer science) and experimental approaches possibly not represented in the unit today. This effort will only be possible with a strong engagement of the University, the CNRS and the IBPS to support the UMR in its development.

p8 : weaknesses and threats : « strengths of the IBPS-CQB should be better defined and integrated and team leaders should clearly show how they want to capitalize on them. »

The meaning of this sentence is not obvious for the members of the Steering Committee. Indeed, many interdisciplinary seminars have been organized by CQB since 3 years. The same is true for the annual international meeting "Cross-disciplinary Genomics", held since 2011 at UPMC.

Response on Team 1: “ Biogenesis of Peptidic Signals ” - T. Foulon (p15-17)

The team thanks the referee for his(her) attentive reading of our scientific assessments and projects and also for his(her) appreciation on our scientific production, and to have become aware of our strong implication in teaching. We are in agreement with most of the remarks and opinions delivered by the referee about the importance of the proposed scientific project within the framework of IBPS. =Nevertheless, we would like to bring several precisions and comments about this report:

- **The number of five technicians mentioned at the beginning of the report includes the positions of executive assistant and maintenance of laboratory and two part-time jobs (80%).**
- **We are aware of our lack of means. However, we do our best to improve both financial and human resources: thus, a new MCU will join the team in January 2014; a request for a new position of MCU or researcher shall also be made next year. Several scientific projects have been sent to grant agencies. We are also in contact with industry since 2009 to raise funds, following the**

deposit of our patents. For the moment, our demands have not been successful.

- Among the eight students that have defended their PhD in the team, 3 are assistant-professors (N. Montagné, UPMC ; J. Simunic, Croatie ; F. Abbassi, Tunisie) ; 1 is ATER (C. Auvinet), 1 is high school teacher after an experience in industry (V-L Pham); 3 have post-doctoral positions (C. Galanth, P. Joanne, J. Pernier).

- We are also aware of our special position within the IBPS. The creation of IBPS should provide a solution to this situation and open up new opportunities for collaborations within the Institute. Following exchanges created during the preparation of the IBPS, collaboration with the team of F. Nothias was started in 2012, and discussions are underway to establish collaborations with the team of D. Higuët.

- In the context of our research topics (structure/function studies, new discovered peptides, peptide processing and post-translational modifications), the close collaboration we have with platforms of mass spectrometry, peptide synthesis and molecular interactions, are conducive to develop new methods and approaches with these different platforms [e.g. detection of disulfide bonds, D-amino acid containing peptides and post-translational modifications using mass spectrometry; development of peptide synthesis analysis (peptide/protein) / membranes and protein-protein].through design of peptide analogues; development of protocols for interactions

For the steering committee

Pierre Netter

