HCERES

High Council for the Evaluation of Research and Higher Education

Research units

HCERES report on research unit:

Optimisation des Régulations Physiologiques

ORPHY

Under the supervision of the following institutions and research bodies:

Université de Bretagne Occidentale - UBO

Evaluation Campaign 2015-2016 (Group B)

HCERES

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Research units

In the name of HCERES,[1]

Michel Cosnard, president

In the name of the experts committee,[2]

Gianfranco Parati, chairman of the committee

Under the decree No.2014-1365 dated 14 november 2014,

[1] The president of HCERES "countersigns the evaluation reports set up by the experts committees and signed by their chairman." (Article 8, paragraph 5)

[2] The evaluation reports "are signed by the chairman of the expert committee". (Article 11, paragraph 2)

Evaluation report

This report is the sole result of evaluation by the expert committee, the composition of which is specified below.

The assessments contained herein are the expression of an independent and collegial reviewing by the committee.

Unit name:	Optimisation des Régulations Physiologiques
Unit acronym:	ORPHY
Label requested:	
Current number:	EA 4324
Name of Director (2015-2016):	Ms Christine MOISAN
Name of Project Leader (2017-2021):	Ms Christine MOISAN

Expert committee members

Chair: Mr Gianfranco PARATI, Universita di Milano-Bicocca, Italy

Experts:

Ms Delphine BORGEL, Université Paris Sud

Mr Georges LEFTHERIOTIS, Université d'Angers

Mr Jean-Jacques RISSO, IRBA, Service de Santé des Armées, Toulon

Ms Clarisse VANDEBROUCK, Université de Poitiers (representative of the CNU)

Scientific delegate representing the HCERES:

Mr Patrick LACOLLEY

Representative of supervising institutions and bodies:

Mr Pascal GENTE, Université de Bretagne Occidentale

Head of Doctoral School:

Mr Christian BROSSEAU, Doctoral School n° 373 "Santé, Information-Communications, Mathématiques, Matière – SICMA"

1 • Introduction

History and geographical location of the unit

The EA 4324 ORPHY (Optimization of the Physiological Regulations) is a research unit in animal and human physiology. The ORPHY team, active in the field of Biology-Health, investigates physiological mechanisms in cardiovascular and metabolic adaptations or alterations, aiming at improving clinic management in terms of prevention and therapeutic strategies. The unit combines clinical and fundamental approaches through the use of several animal models. ORPHY acquired an expertise in the evaluation of the effects of environmental constraints (hyperbaric physiology, physical exercise, nutrition) and of pathologic states on the physiological performances (metabolic, cardiovascular…).

The ORPHY Team is located on the campus of the faculty of Sciences and Technology of the University of Bretagne Occidentale (UBO). The ORPHY lab is constituted of 31 members: 15 professors and associate professors, 2 hospital practitioners, 5 (2.5 FTE) administrative and technical members BIATSS and 2 engineers under temporary contracts, who come from 4 faculties of the UBO (Sciences and Technology, Sciences of the Sport and Education, Medicine and Sciences of Health, Lettres and Social sciences).

The team MuST (EA 1274) originates from the EA-4326 “Facteurs nerveux et structuration tissulaire” originally headed by Mr Maxime GIOUX and now headed by Ms Marie-Agnès GIROUX-METGES. MuST has already been evaluated by HCERES and will join ORPHY for the next contract in 2017.

Management team

The ORPHY unit is headed by Ms Christine MOISAN.

HCERES nomenclature

SVE1 LS4: Physiology, physiopathology, medical systemic biology

Scientific domains

Biology, medicine and health, hyperbaric, shock, exercise, environmental extreme conditions.

Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	16	17
N2: Permanent researchers from Institutions and similar positions	2	4
N3: Other permanent staff (technicians and administrative personnel)	3 (FTE)	3 (FTE)
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	1	
N6: Other contractual staff (technicians and administrative personnel)	1	
N7: PhD students	6	
TOTAL N1 to N7	**29**	
Qualified research supervisors (HDR) or similar positions	9	

Unit record	From 01/01/2010 to 30/06/2015
PhD theses defended	11
Postdoctoral scientists having spent at least 12 months in the unit	2
Number of Research Supervisor Qualifications (HDR) obtained during the period	

2 • Overall assessment of the unit

Introduction

The EA 4324 ORPHY (Optimization of Physiological Regulations) is a research unit interested in animal and human physiology. They combine clinical and basic approaches through the use of different animal models. ORPHY was created in 2008 following the reorganization of the EA 3879 (Physiology Unit Comparative and Integrative), with the objective to structure the Brest physiology community in terms of research and training. Between 2008 and 2011, EA4324 had focused on 2 main research axes, one concerning marine biology and the second health biology. In 2011, following the recommendations of the previous evaluation by AERES, the group made a major effort of thematic convergence, which led them to dismiss the ecophysiology axis of their research. Thus, between 2011 and 2015, a great effort was made to share expertise and experimental approaches between the different members of the team. Since 2011, their scientific main goal has been to study the physiological mechanisms involved in cardiovascular and

metabolic adaptations or alterations, in particular in response to stressful environmental conditions (hyperbaric conditions, exercise, nutrition, haemorrhagic and septic shocks) fields in which this team of researchers has a great expertise. A large part of the research concerns the study of muscle physiology, namely skeletal and smooth vascular muscles and of biological responses to various extreme conditions.

Global assessment of the unit

As compared to the previous evaluation in 2010 there has been a significant improvement in the scientific production (IF from 3.4 to 4.4), in the number of PhD theses (11 thesis defended) and in the focus of scientific research in spite of the reduction in the number of researchers (from 18 to 16). In particular, they followed the advice given to them in 2010 to redirect their scientific interest, and they dismissed the ecophysiology topic that was out of focus in relation to the new project. Moreover, even if a second group (MuST) will join ORPHY in 2017, they won't increase the number of research topics. The unit is still combining clinical research and basic science, although not always in a well-connected manner. They also have improved their technical collaboration by sharing different techniques originally mastered by each team.

Strengths and opportunities in the context

- large number of permanent researchers (n=18), although recruitment of an assistant engineer and an assistant professor would be beneficial;
- complementary expertise of MuST and ORPHY;
- collaboration with clinicians (cardiologist and intensive care unit personnel based at the CHRU Cavale Blanche);
- collaboration with the lung function testing unit at the CHRU (headed by Ms Marie-Agnès GIROUX-METGES);
- good involvement in local and regional master courses;
- good level of attractivity, mainly due to the international ITN Marie Curie "PHYPODE" project;
- efforts made to reinforce the administrative team by hiring a full time officer;
- efforts to maintain their unique and internationally acknowledged expertise on hyperbaric medicine with dedicated unique and specific technical devices (small animal and isolated cells hyperbaric chamber);
- quality of young scientists and physicians involved, some of them carrying the potential of becoming PIs.

Weaknesses and threats in the context

- not enough HDRs (9 for ORPHY and 3 for MuST);
- no full time researcher or engineer, in particular lack of a permanent engineer and not only a tenured position in the team; there is a risk of losing the expertise in small animal hyperbaric chamber with the retirement of a technician;
- disparity in international reputation of the team members;
- limited level of international interaction, except in the hyperbaric field as exemplified by the PHYPODE project;
- uneven quality of technical people recruited, ranging from limited skills to high level professional capabilities, as exemplified by the development of a small animal hyperbaric chamber (this also raises the problem of how to maintain such technical expertise when the technician currently in charge of this approach will retire);
- limited connections between the clinical topics and the basic research conducted in the 2 teams (MuST and ORPHY);
- absence of post-docs;

- uneven combination of some too traditional methodological approaches with innovative approaches, such as the hyperbaric chamber which is unique in this field worldwide as well as the pressure chamber microscopy developed by this team;
- sustainability of the post "PHYPODE" project: there is a need to define what the follow up of this project will be.

Recommendations

The committee recommends:

- to increase the link between basic and clinical research, facilitating the development of translational and precision medicine; the committee feels that "muscles" (both skeletal and smooth) could represent a common key word to construct a collaborative project;
- to focus on fund raising in order to hire full time researchers on contracts (and to ask to the university for obtaining permanent positions) and full time administrative personnel (currently only available for 20% of their time);
- to increase the level of international interactions and networking, starting from post-doctoral fellows up to young researchers;
- to try to further increase the quality, the impact (publishing also in more general journals with larger audiences) and the number of publications; also, thanks to an increased international networking, to try to increase the quality and the size of consortium to carry out the projects;
- to improve the exchanges between the two joining labs by focusing on methodological aspects and innovative technologies in their respective research fields;
- to aim at a geographical re-localization which may facilitate better interactions. The efforts of collaboration with the other units of the site need to be reinforced as well as the link between clinical and basic research, facilitating translational development.