Research evaluation

FINAL RESUME ON THE RESEARCH UNIT

SOPAM - Oxidative Stress and Metabolic Diseases

UNDER THE SUPERVISION OF THE FOLLOWING INSTITUTIONS AND RESEARCH BODIES:

Université d'Angers
Institut national de la santé et de la recherche médicale - INSERM

EVALUATION CAMPAIGN 2020-2021
GROUP B

Report published on December, 01 2021

In the name of Hcéres[1]:	In the name of the experts committee[2]:
Mr Thierry Coulhon, President	Mr Luc Bertrand, Chairman of the committee

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

[1] The president of Hcéres "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 experts committee". (Article 11, paragraph 2).

Tables in this document were filled with certified data submitted by the supervising body on behalf of the unit.

UNIT PRESENTATION

Unit name:
Oxidative Stress and Metabolic Diseases
Unit acronym:
SOPAM
Current label and N°:
INSERM UMR 1063
ID RNSR:
201220221G
Application type:
Fusion, scission, restructuring
Head of the unit (2020-2021):
Mr Ramaroson Andriantsitohaina
Project leader (2021-2025):
Mr Alain Lacampagne
Number of teams and/or themes:
1

EXPERTS COMMITTEE MEMBERS

Chair:	Mr Luc Bertrand, Université Catholique de Louvain, Belgique
Experts:	Mr Jean-François Arnal, CHU de Toulouse (representative of CSS INSERM) Mr Ari Chaouat, CHRU Nancy (representative of CNU) Mr René Ferrera, INSERM, Bron (supporting personnel) Ms Amandine Gautier-Stein, Inrae, Lyon (representative of CoNRS) Ms Christine Morand, INRAE, Saint-Gènes-Champanelle

HCÉRES REPRESENTATIVE

Mr Jean-Marc Lobaccaro

REPRESENTATIVES OF SUPERVISING INSTITUTIONS AND BODIES

Mr Raymond Bazin, INSERM
Mr Christian Boitard, INSERM, ITMO Physiopathologie, métabolisme, Nutrition
Mr Yvan De Launoit, CNRS, Institut des Sciences Biologiques
Mr François Pierrot, Université de Montpellier
Mrs Carina Prip-Buus, CNRS, Institut des Sciences Biologiques

INTRODUCTION

HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

The UMR INSERM 1063 Oxidative Stress and Metabolic Diseases, also called SOPAM (for Stress Oxydant et PAthologies Métaboliques), is one of the eleven groups of the Pole of Health of the University of Angers. This unit was created in 2012 and renewed in 2017. Located at the third floor of the Institute of Biology and Health in the CHU of Angers, this unit is working on oxidative stress and metabolic diseases. The Institute hosts most of the Research teams and Technical Platforms of the Pole of Health of Angers and the Platform of Hospital Biology in the same building. For the next contract, the unit will move in Montpellier joining the PhyMedEx unit under the INSERM, CNRS and Montpellier University supervising bodies, which is composed of five existing teams, SOPAM becoming the sixth team of this unit.

RESEARCH ECOSYSTEM

SOPAM participates as leader to the constitution of the "Groupe Angevin de Recherche sur la Maladie Dysmétabolique" that regroups ten clinical services of the CHU of Angers and six preclinical laboratories.

SOPAM within the "Structure Federative of Research (SFR), ICAT 4802" (Cellular Interaction and Therapeutics Applications) is involved in the development of equipment's related to (i) imaging of small animal allowing non-invasive investigation of functional and structural abnormalities of different organs and tissues, tumor localizations and metabolic disorders and (ii) extracellular vesicles (EV) characterization.

The unit is composed of seventeen permanent staff members with nine scientists and eight engineers/technicians (mix of INSERM/CNRS and university). Fifty % of the scientists are clinicians. Three staff members (1 CR-CNRS, 1 PU-PH and 1 MCU-PH) retired during the previous contract, one IR-INSERM joined the unit in 2019 to focus on electron paramagnetic resonance technologies.

HCÉRES NOMENCLATURE AND THEMATICS OF THE UNIT

SVE5 « Physiologie, Physiopathologie, Cardiologie, Pharmacologie, Endocrinologie, Cancer, Technologies Médicales »

SOPAM unit research interest is centred on two main axes. First, the unit research focused on the study of the importance of Extracellular Vesicles (EV) in metabolic dysfunctions with a particular interconnection between metabolic syndrome and obstructive sleep apnoea syndrome (OSAS). This translational (from basic to clinical) research has developed expertise on different EV types including micro-vesicles and exosomes. Second, the group developed therapeutic strategies to fight metabolic dysfunctions using EV or nutritional approaches with a particular interest on polyphenols. Each axis is declined in several thematics/topics.

MANAGEMENT TEAM

The unit has a simple organization and was headed by Mr Ramaroson Andriantsitohaina. Ms Carmen Martinez will be the new unit leader for the future contract.

UNIT WORKFORCE

Active staff	Number 06/01/2020	Number 01/01/2022
Full professors and similar positions	3	0
Assistant professors and similar positions	1	0
Full time research directors (Directeurs de recherche) and similar positions	2	2
Full time research associates (Chargés de recherche) and similar positions	1	0
Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.")	2	0
High school teachers	0	0
Supporting personnel (ITAs, BIATSSs and others, notably of EPICs)	8	8

Permanent staff	**17**	**10**
Non-permanent professors and associate professors, including emeritus	0	
Non-permanent full-time scientists, including emeritus, post-docs (except PhD students)	1	
PhD Students	6	
Non-permanent supporting personnel	0	
Non-permanent staff	**7**	
Total	**24**	**10**

GLOBAL ASSESSMENT OF THE UNIT

The SOPAM unit conducted an original research in the field of Extracellular Vesicles (EVs) and metabolic diseases such as metabolic syndrome and obstructive sleep apnoea symptom (OSAS). They have proposed novel therapeutic strategies using EVs biology or polyphenols to fight against such metabolic dysfunctions. They particularly developed specific engineering of EVs in the context of nanomedecine (notably for the treatment of myocardial infection and of neurons). This innovative therapeutic approach is of high impact and potential. Working on the links between, on the one hand, OSAS and metabolic syndrome, and on the other hand, the risk of cardiovascular diseases is an excellent choice of the unit because of their major impact on overall health. The unit, well balanced between basic and clinical researchers, has consolidated (inter)national and local cohorts, which allowed SOPAM to provide parameters on the interconnection between metabolic syndrome and OSAS and to identify EVs as biomarkers of several metabolic dysfunction characteristics of metabolic syndrome.

SOPAM has produced 175 articles, 78 articles in first or last positions (44 %), with seventeen (half from clinical studies) in high-profile journals such as *Journal of Extracellular Vesicles*, *European Respiratory Journal, Pharmacology and Therapeutics, Thorax,* ... They also published reviews in high profile journals (such as *Journal of Extracellular Vesicles*, *Circulation Research*). However, despite the overall quality of their publication track record, the major part of the papers published is of middle range.

SOPAM has succeeded in obtaining national grants (including 330 k€/year obtained with ANR - one as coordinator, one as partner - and one PHRC as partner) and in coordinating a European ERA-NET EURONANOMED, evidencing their European leadership. Its European visibility is illustrated by the coordination of the European consortium EURONANOMED, the organization of international conferences (International Conference of Polyphenols and Health in 2015; EMBO workshop caveolae and nanodomains in 2019). International recognition could be reached by improving its visibility outside Europe since they received only ten international conference invitations.

SOPAM has valorised its research through one accepted patent and two consecutive R&D contracts with SATT Ouest Valorisation, however this is room for improvement in particular by obtaining contracts with pharmaceutical companies.

SOPAM has trained twenty Master 1 and eleven Master 2 students and twenty-two PhD students. Fourteen PhD theses have been successfully defended over the period with an average of 2.8 publications in good journals per PhD with a mean duration for PhD defense around thirty-nine months.

For the next five-year contract, the project proposed is the perfect continuation of the previous research axes and plans to develop innovative therapeutic strategies to treat metabolic dysfunctions. The new project will be a little bit challenging due to the fact that the unit will move from Angers to the PhyMedExp unit located in Montpellier. This is concomitant to modification in the team organization with several researchers who have recently retired. This new location and interaction should be taken as an opportunity to prioritize their research on the most interesting work-packages they originally proposed and to take advantages of the new environment and expertise of the other teams of the new unit they are joining, even though the project could be considered as oversized compared to the present workforce moving (two permanent DR, one PhD, one post-doctoral fellow).

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