# ACAI - Adaptation cardiovasculaire à l'ischémie

Rapport Hcéres

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

# HCERES report on research unit:

## Cardiovascular Adaptation to Ischemia

## ACAI

# Under the supervision of the following institutions and research bodies:

## Université de Bordeaux

## Institut National de la Santé Et de la Recherche Médicale - INSERM

Evaluation Campaign 2014-2015 (Group A)

# HCERES

High Council for the Evaluation of Research and Higher Education

## Research units

*In the name of HCERES,*[1]

Didier HOUSSIN, president

*In the name of the experts committee,*[2]

Jean-Sébastien SILVESTRE, chairman of the committee

Under the decree N°.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 result of the evaluation by the experts committee, the composition of which is specified below.

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

| | |
|---|---|
| Unit name: | Cardiovascular Adaptation to ischemia |
| Unit acronym: | |
| Label requested: | UMR |
| Present no.: | UMR 1034 Inserm |
| Name of Director (2014-2015): | Mr Thierry COUFFINHAL |
| Name of Project Leader (2016-2020): | Mr Thierry COUFFINHAL |

# Expert committee members

| | |
|---|---|
| Chair: | Mr Jean-Sébastien SILVESTRE, Inserm, Paris |
| Experts: | Ms Marie-Christine ALESSI, Inserm, Marseille (representative of the CSS Inserm) |
| | Ms Lina BADIMON, Institut Català de Ciències Cardiovasculars, Barcelona, Spain |
| | Mr Christophe BAUTERS, CHRU de Lille |

## Scientific delegate representing the HCERES:

Mr Jean GIRARD

## Representatives of the Unit's supervising institutions and bodies:

Mr Pierre DOS SANTOS, Health & Life Science Department, University of Bordeaux

Ms Chantal LASSERRE PINTO, Scientific Evaluation Department, Inserm, Paris

Mr Roger MARTHAN (representative of Doctoral School n°154 "Biological and Health Science")

# 1 • Introduction

## History and geographical location of the Unit

This Inserm/University of Bordeaux unit evolves since nearly 40 years in the scientific community of Bordeaux. Inserm has provided on-going support to the unit through successive long-term period grants from 1976 to 1996 (Inserm U 8) and then from 1996 to 2006 (Inserm U 441), dealing with molecular and cellular mechanisms of atherosclerosis. In 2006, the current director, Mr Thierry COUFFINHAL, engaged a reflection for the development of a new project aiming at deciphering the mechanisms of vascular formation and adaptation to ischemic conditions. On January 1st 2007, the Inserm unit "Cardiovascular adaptation to ischemia" was created with two teams: team 1 "Neovessel maturation" and team 2 "Vessel repair and cardioprotection". The unit was then affiliated to both Inserm and University of Bordeaux under the heading U 828. It was part of the "*Institut Fédératif de Recherche*" IFR 4-FR21 "Heart-Lungs-Vessels-Thrombosis". On January 2011, the current unit (U 1034) was created with one team "Cardiovascular adaptation to ischemia" led by Mr Thierry COUFFINHAL. The unit is part of the "*Fédération de Recherche TransBioMed*" from the health and Life Science Department - University of Bordeaux.

The unit works in an Inserm building erected in 1976 on the South part of the Bordeaux Medical School (University of Bordeaux), on the area belonging to the Haut-Lévêque University Hospital and the Cardiology Hospital. The total surface of the building is about 1 624 m². This surface includes the animal facility and the laundry (654 m²). As it was built 40 years ago with materials of average resistance, the building has just benefited from a rehabilitation process (June 2012-July 2013).

## Management team:

From 2011 to 2015, the unit was organised into four sub-themes: I) new vessel maturation, II) vascular repair, III) platelet/endothelial cell interactions and IV) hemodynamic adaptation to cardiopulmonary failure. For the 2016 to 2020 timeframe, the unit will be organized into four new and innovative sub-themes: I) Hedgehog and vessel disease, II) Wnt/Frizzled in vessel organization and function, III) Endothelial cells in thrombosis and IV) Improving hemodynamics in the ischemic heart. Mr Thierry COUFFINHAL will head the new unit.

## HCERES nomenclature

SVE1_L4

## Unit workforce

| Unit workforce | Number as at 30/06/2014 | Number as at 01/01/2016 |
|---|---|---|
| **N1**: Permanent professors and similar positions | 18 | 17 |
| **N2**: Permanent researchers from Institutions and similar positions | 3 | 3 |
| **N3**: Other permanent staff (without research duties) | | |
| **N4**: Other professors (Emeritus Professor, on-contract Professor, etc.) | 2 | 1 |
| **N5**: Other researchers (Emeritus Research Director, Postdoctoral students, visitors, etc.) | 2 | 2 |
| **N6**: Other contractual staff (without research duties) | 2 | |
| **TOTAL N1 to N6** | **27** | **23** |

| Unit workforce | Number as at 30/06/2014 | Number as at 01/01/2016 |
|---|---|---|
| Doctoral students | 7 | |
| Theses defended | 11 | |
| Postdoctoral students having spent at least 12 months in the Unit | 2 | |
| Number of Research Supervisor Qualifications (HDR) taken | 2 | |
| Qualified research supervisors (with an HDR) or similar positions | 13 | 15 |

# 2 • Overall assessment of the Unit

## Global assessment of the unit

The main overall objective of the unit was a better understanding of the mechanisms supporting the development of the blood clot as well as the formation and the maintenance of functional vessels in the ischemic milieu. The secondary objective was to improve or develop new therapeutic strategies to ameliorate tissue perfusion in ischemic pathologies. During the last 5 years, the unit has pursued major effort towards the development of both experimental and technical approaches. Progresses made in the relevant field are considerable and highlighted by publications in high-ranked journal. For the five next years, the aim of the project is to better define the roles of the endothelium and some of the endothelial-related pathways such as hedgehog and/or Wnt/frizzled in vessel organization and function. The objective is also to improve the knowledge of the cross talk between endothelium and tissue homeostasis by deciphering the impact of the non-endothelial compartment (i.e nerves, muscles) on the vascular part as well as to analyze the role of endothelial cells on non-endothelial part (i.e blood cells/thrombosis). The background, as well as the theoretical and practical knowledge of unit members perfectly match with the whole objective of the project.

## Strengths and opportunities in relation to the context

There is a comprehensive ad equation between the organization and the scientific objectives of the unit. Strategic decisions are taken on a higlighly collegial basis. The accessibility of the common resources as well as the diffusion of scientific policies and research programs are excellent. The quality of student guidance, supervision and follow-up is of great magnitude. The unit's members show major participation in coordinating master's courses and in the different programs of the doctoral school. unit members expertizes and know-how strongly suggest that they will reach their scientific objectives. Each project requires interdisciplinary approach, may have some clinical perspectives and benefits from casual link between basic and applied researchers.

## Weaknesses and threats related to the context

There is a clear unbalance between the number of team members and their involvement in full-time research. Hence, the relevant clinical activities of a significant number of clinicians/pharmacists do not complement the general endothelial cells-driven hypothesis developed in the unit. International reputation and funding do not correspond to the quality and the strong proficiency of team members.

## Recommendations

Given their expertizes in their respective fields of research, unit members are encouraged to develop their international academic reputation and appeal.

A specific effort should be done to increase the number of full-time researchers as well as international post-doctoral fellows in the different themes.

Attempt should be fixed to initiate collaborative works between themes.

Unit members are inspired to apply for external source of fundings as principal investigators.

Specific attempts could be achieved to better integrate the clinical and basic approaches.