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## L'unité de recherche de l'institut du thorax

Rapport Hcéres

► **To cite this version:**

Rapport d'évaluation d'une entité de recherche. L'unité de recherche de l'institut du thorax. 2016, Université de Nantes, Centre national de la recherche scientifique - CNRS, Institut national de la santé et de la recherche médicale - INSERM. hceres-02034566

**HAL Id: hceres-02034566**

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Submitted on 20 Feb 2019

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# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

HCERES report on research unit:

Institut du thorax

Under the supervision of  
the following institutions  
and research bodies:

Université de Nantes

Centre National de la Recherche Scientifique - CNRS

Institut National de la Santé et de la Recherche

Médicale - INSERM

# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

*In the name of HCERES,<sup>1</sup>*

Michel Cosnard, president

*In the name of the experts committee,<sup>2</sup>*

Paolo Madeddu, chairman of the committee

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

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

<sup>2</sup> 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:	Institut du thorax
Unit acronym:	
Label requested:	UMR_S and CNRS UMR
Current number:	UMR_S 1087 / CNRS UMR 6291
Name of Director (2015-2016):	Mr Hervé LE MAREC
Name of Project Leader (2017-2021):	Mr Richard REDON

## Expert committee members

Chair:	Mr Paolo MAEDDU, University of Bristol, UK
Experts:	Mr Antonio Paolo BELTRAMI, University of Udine, Italy
	Ms Catherine BOILEAU, University of Paris 13
	Mr Alberico CATAPANO, University of Milan, Italy
	Ms Carlie DE VRIES, University of Amsterdam, The Netherlands
	Mr Jules HANCOX, University of Bristol, UK
	Mr Stephane HATEM, University of Paris 6 (representative of the CSS INSERM)
	Mr Peter HORDJIK, University of Amsterdam, The Netherlands
	Mr Richard ISNARD, University of Paris 6 (representative of the CNU)
	Ms Dominique SIGAUDDO-ROUSSEL, University of Lyon (representative of the CoNRS)

### Scientific delegate representing the HCERES:

Mr Patrick LACOLLEY

### Representatives of supervising institutions and bodies:

Mr Frédéric BENHAMOU, University of Nantes

Mr Alain EYCHENE, CNRS

Ms Chantal LASSERRE, INSERM

### Head of Doctoral School:

Ms Corinne MIRAL, Doctoral School, ED n° 502 "École Doctorale Biologie Santé Nantes Angers"

## 1 • Introduction

### History and geographical location of the unit

This research unit was first recognized by INSERM in 1996 and renewed several times as an INSERM structure. It has been integrated since 2004 into the Institut du Thorax, a National Thematic Centre for Research and Healthcare. In 2013, the research unit became a core member of the DHU 2020, a translational department labelled by the French National Alliance for Life Sciences and Health, Nantes University Hospital and the University of Nantes.

The unit is located at the IRS-UN of Nantes, a university building opened in 2009, in a total of 2.600 m<sup>2</sup> dispatched between 2 levels. Animal facilities, technological platforms and biotech companies are located in the same building.

### Management team

The unit is currently headed by Mr Hervé LE MAREC. For the next 5 years, the unit will be directed by Mr Richard REDON with the help of Ms Gervaise LOIRAND as deputy head.

### HCERES nomenclature

SVE1\_LS4

### Scientific domains

Cardiovascular, respiratory and metabolic disease, population science, genetics of human diseases.

### Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	23 (FTE 8.1)	21 (FTE 7.7)
N2: Permanent researchers from Institutions and similar positions	16 (FTE 16)	15 (FTE 15)
N3: Other permanent staff (technicians and administrative personnel)	30 (FTE 22.3)	29 (FTE 22.7)
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)	1 (FTE 0.5)	
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	6 (FTE 6)	
N6: Other contractual staff (technicians and administrative personnel)	41 (FTE 33.4)	
N7: PhD students	20 (FTE 20)	
<b>TOTAL N1 to N7</b>	<b>137 (FTE 106.3)</b>	
Qualified research supervisors (HDR) or similar positions	25	

Unit record	From 01/01/2010 to 30/06/2015
PhD theses defended	36
Postdoctoral scientists having spent at least 12 months in the unit	22
Number of Research Supervisor Qualifications (HDR) obtained during the period	4

## 2 • Overall assessment of the unit

### Introduction

The unit was initially focused on cardiac arrhythmias and vascular signalling. During the last years, the teams of the unit have developed an increasingly strong interest in genomics and pathophysiology of cardiovascular, metabolic and respiratory diseases. In addition, they have pursued a strategy oriented to translate scientific outputs into personalized treatment of human diseases.

### Global assessment of the unit

The unit comprises 160 investigators and is organized in 7 teams, of which 2 focusing on human genetics, 4 on the pathophysiology of cardiovascular and respiratory disease and 1 on therapeutic innovation. Recruitment of new staff since 2010 consists of 15 new permanent positions, 4 research associates, 4 associate professors and 7 professors. 15 post-doctoral researchers have been recruited in the same period. On top of the ones previously mentioned, 2 new positions have been secured to expand the research on heart failure.

The unit is embedded in a university hospital and has significant connections with National and International networks. Since 2010 they have generated 249 publications, 20% of which are outstanding (IF>10). Of 249 publications, 130 have a member of the team as first/senior author. There is a strong commitment to training and communication. The unit has organized various scientific events and was active in communicating with the lay public through different activities. In addition, the team has been associated to 4 major scientific networks, of which 1 is supported by the FP7 EU programme. The unit has received national and international awards for outstanding scientific contributions in genetics of cardiovascular disease, heart failure, metabolic disease and hypertension. The declared mission for the next 5 years is to strengthen the scientific standing, harmonizing the production of different teams and setting up increased collaboration with clinicians to allow the exploitation of preclinical results.

Overall the unit has performed very well during the last 5 years. The written document and the presentations have provided clear evidence of competitiveness at an international level. Large and impressive observational data emerge from genetic and population based studies of the unit. There is a clear commitment from local institutions, i.e. the university and hospital, to support the institute.

### Weaknesses and threats in the context

The distribution of publications is moderately skewed among teams, with the cardiovascular genetics team being distinctively outstanding in this regard. However, the average publication record is generally excellent and there is a plan to invest on new technologies to increase research novelty and competitiveness. The written document did not state the actual turnover of personnel during the last 5 years and criteria of recruitment and retention. However, these points were clarified during the onsite visit and appear in line with international standards.

Difficulties in recruiting exceptional talents from abroad have been a matter of discussion. The unit has in place a plan to fill the gap through a more intensive valorisation of its scientific results and through networking at the international level.

## Recommendations

Since the declared mission is to invest in translational research and personalized medicine, the unit should make a major effort to produce significant results on functional phenotyping, and to translate these results into druggable targets. It was noted that the unit is investing on innovation, yet maintaining the focus on its field of recognized expertise. One emerging concept is the use of iPSCs, especially from urine samples, which could be used in screenings for the study of inherited diseases. This could turn out to be a very potent instrument, but given the current limitation of complete differentiation of iPSCs into mature cardiovascular cells, they should be cautious not to invest only in this tool for innovation. In fact, they have identified multidisciplinary approaches (mathematics, bioinformatics etc) that could complement the present approach. The number of ongoing projects is high and may need some critical appraisal in the next 12 months to ensure feasibility. Measures to increase internationalization need to be considered to improve the unit's attractiveness. This should be part of a wider plan to create collaborative associations with excellence centres abroad seeding the soil for international grants applications.