

# IADI - Imagerie adaptative diagnostique et interventionnelle

Rapport Hcéres

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# HCERES

High Council for the Evaluation of Research  
and Higher Education

Department of Research Evaluation

report on research unit:

Diagnostic and Interventional Adaptive Imaging

IADI

under the supervision of  
the following institutions  
and research bodies:

Université de Lorraine

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

Evaluation Campaign 2016-2017 (Group C)

# HCERES

High Council for the Evaluation of Research  
and Higher Education

Department of Research Evaluation

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

Michel Cosnard, president

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

Chretien Moonen, 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:                             | Diagnostic and Interventional Adaptive Imaging |
| Unit acronym:                          | IADI   |
| Label requested:                       | UMR  |
| Current number:                        | U947   |
| Name of Director<br>(2016-2017):       | Mr Jacques FELBLINGER                          |
| Name of Project Leader<br>(2018-2022): | Mr Jacques FELBLINGER                          |

## Expert committee members

|   |  |
|---|--|
| Chair:  | Mr Chretien MOONEN, University Medical Center, Utrecht, The Netherlands  |
| Experts:  | Mr Olivier CLÉMENT, Université Paris 5 (representative of INSERM)<br><br>Ms Hélène GROS-DAGNAC, Université Toulouse 3 (representative of supporting personnel)<br><br>Ms Françoise PEYRIN, INSA Lyon                         |
| Scientific delegate representing the HCERES:            | Ms Véronique MIGONNEY  |
| Representatives of supervising institutions and bodies: | Ms Clotilde BOULANGER, Université de Lorraine<br><br>Mr Marc BRAUN, Université de Lorraine<br><br>Ms Marie-Josèphe LEROY-ZAMIA, INSERM   |
| Heads of Doctoral Schools:                              | Mr Patrick MENU, Doctoral School n°266, “Biologie, Santé, Environnement (BioSE)”<br><br>Mr Dominique MERY, Doctoral School n°77, “Informatique, Automatique, Électronique électrotechnique et Mathématiques (IAEM Lorraine)” |

## 1 • Introduction

### History and geographical location of the unit

The “Imagerie Adaptive Diagnostique et Interventionnelle” laboratory (IADI) was created “ex-nihilo” in 2005 with a Regional and INSERM recognition called ESPRI (“Équipe Soutenue par la Région et l’INSERM”). In 2009, IADI became an INSERM unit U 947 for the periods 2009-2012 and 2013-2017.

IADI is hosted at the University hospital (CHRU) of Nancy. In May 2016, the IADI laboratory has been moved to join the “research building” of the university hospital. This place will include in 2 years all the research groups involved in clinical research and applied research at the university hospital.

### Management team

The director, Mr Jacques FELBLINGER was hired in 2001. Mr Pierre-André VUISOZ acts as deputy director.

### HCERES nomenclature

SVE5 Physiologie, Physiopathologie, Cardiologie, Pharmacologie, Endocrinologie, Cancer, Technologies Médicales.

### Scientific domains

The activities of the IADI unit are centered on Magnetic Resonance Imaging (MRI) of moving organs in human.

In particular, the unit developed a new technique called adaptative imaging taking into account and integrating organs motion (physiological movement during image acquisition, image reconstruction and image post-processing).

Several innovative applications of MRI are proposed by IADI such as: cardiac MRI, placenta MRI, methodologies for breast cancer screening but also integration of MRI data.

Unit workforce

| Unit workforce   | Number on 30/06/2016 | Number on 01/01/2018 |
|--|----------------------|----------------------|
| N1: Permanent professors and similar positions                         | 14<br>(3,4 FTE)      | 15<br>(3,6 FTE)      |
| N2: Permanent researchers from Institutions and similar positions      | 1<br>(1 FTE)         | 2<br>(2 FTE)         |
| N3: Other permanent staff (technicians and administrative personnel)   | 8<br>(5,75 FTE)      | 11<br>(8,25 FTE)     |
| N4: Other researchers (Postdoctoral students, visitors, etc.)          | 4<br>(4 FTE)         |                      |
| N5: Emeritus   | 0                    |                      |
| N6: Other contractual staff (technicians and administrative personnel) | 5<br>(4 FTE)         |                      |
| N7: PhD students   | 15                   |                      |
| TOTAL N1 to N7   | 47<br>(33,15 FTE)    |                      |
| Qualified research supervisors (HDR) or similar positions              | 13                   |                      |

| Unit record   | From 01/01/2011 to 30/06/2016 |
|---|-------------------------------|
| PhD theses defended   | 21                            |
| Postdoctoral scientists having spent at least 12 months in the unit           | 4                             |
| Number of Research Supervisor Qualifications (HDR) obtained during the period | 4                             |

## 2 • Assessment of the unit

### Global assessment of the unit

The IADI laboratory is a single research team unit. The main scientific goal of the IADI unit during the evaluation period has been the development of Magnetic Resonance Imaging (MRI) methods of moving organs in humans in order to (i) reduce motion artifacts, (ii) improve spatial resolution of morphological and functional images and (iii) use motion sensitive techniques. To this aim, the unit has developed an imaging chain integrating respiratory and cardiac motion sensors in the acquisition, reconstruction and post-processing steps. The research is covering various fields going from instrumentation, experimental data acquisition and signal processing. Another center of interest of IADI is data management with the development of their own platform of image processing and of secure transmission of research images (Archimed).

At present, the IADI laboratory benefits from many collaborations with external companies, and this is a great support (financial and human). The IADI is an international reference in terms of research on MR safety and MR compatibility. The proximity between IADI and CIC-IT (Centre for Clinical Investigation - Technological Innovation) of Nancy has been a real strength for the clinical validation and valorization of the technical research (MRI methods and technologies) arising from the IADI team and to confirm the scientific recognition.