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## **B2OA - Laboratoire de bioingénierie et biomécanique ostéo-articulaires**

Rapport Hcéres

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## REPORT ON THE RESEARCH UNIT:

Laboratory for Osteo-Articular Bioengineering  
and Bioimaging (B2OA)

## UNDER THE SUPERVISION OF THE FOLLOWING INSTITUTIONS AND RESEARCH BODIES:

Université Paris Diderot

Centre National de la Recherche Scientifique -  
CNRS

École Nationale Vétérinaire d'Alfort - ENVA

Institut national de la santé et de la recherche  
médicale - Inserm

**ÉVALUATION CAMPAIGN 2017-2018**  
GROUP D



In the name of Hcéres<sup>1</sup>:

Michel Cosnard, President

In the name of the expert committee<sup>2</sup>:

Joëlle Amedee, Chairwoman of the  
committee

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

<sup>1</sup> The president of Hcéres "countersigns the evaluation reports set up by the expert 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).

This report is the sole result of the unit's 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 PRESENTATION

<b>Unit name:</b>	Laboratory for Osteo-Articular Bioengineering and Bioimaging
<b>Unit acronym:</b>	B2OA
<b>Requested label:</b>	UMR
<b>Application type:</b>	Restructuration
<b>Current number:</b>	UMR CNRS 7052
<b>Head of the unit (2017-2018):</b>	Mr Hervé PETITE
<b>Project leader (2019-2023):</b>	Mr Hervé PETITE
<b>Number of themes:</b>	3

## COMMITTEE MEMBERS

<b>Chair:</b>	Ms Joëlle AMEEDÉ, Université de Bordeaux
<b>Experts:</b>	Mr Damien LOEUILLE, Université de Nancy (representative of CNU) Mr Frédéric MALLEIN-GERIN, LBTI Lyon (representative of CoNRS) Mr Matthieu REFREGIERS, Synchrotron Soleil (supporting personnel) Mr Arnaud SCHERBERICH, Université de Bâle, Suisse Mr Juergen SIEPMANN, Université de Lille (representative of Inserm CSS)
<b>HCERES scientific officer:</b>	Mr Jean-Paul LALLÈS
<b>Representatives of supervising institutions and bodies:</b>	Mr Franck LETHIMONNIER, Inserm Mr Yves REMOND, CNRS Mr Renaud TISSIER, ENV Maisons-Alfort Mr Matthieu RESCHE-RIGON, Université Paris Diderot

# INTRODUCTION

## HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

This unit was founded in 1977 as "Laboratory of Orthopaedic Research" (LOR), affiliated to CNRS. Since 1998, the LOR merged with three other laboratories, involved in experimental radiology (a part of Paris Diderot University), Biomaterials and polymers (a part of Paris 13 University) and a laboratory of biomechanics (a part of Paris 12 University). This unit was then restructured first in 2008 and then in 2012 by the CNRS-SPI, as the "Laboratory for Osteo-Articular Bioengineering and Bioimaging" (B2OA). In 2012, this unit was affiliated to the "École Nationale Vétérinaire de Maisons-Alfort", thanks to the hiring of two veterinary doctors in the unit. The unit is localised in the UFR of Medicine of Paris Diderot University.

## MANAGEMENT TEAM

Since 2012, Mr Hervé PETITE is the director and Mr Didier HANNOUCHE was deputy director from 2012 to 2015. Mr Rémi NIZARD was elected as deputy director in 2015.

## HCERES NOMENCLATURE

SVE5-1; SVE5-3.

## SCIENTIFIC DOMAIN

This unit is organized in three main themes. The first theme focuses on bone tissue engineering, the understanding of the parameters affecting mesenchymal stem functions in a micro-environment, the influence on the diabetic environment on bone healing. The second theme is dedicated to the improvement of the bone – implant interfaces, based on the clinical evaluation of joint prosthesis understanding of the peri-prosthetic implant. The third theme focuses on the multi-scale imaging of osteoarticular tissue, including mainly X-ray bioimaging methods for the diagnosis of osteoarthritis and fracture prediction.

## UNIT WORKFORCE

Unit workforce	Number 30/06/2017	Number 01/01/2019
<b>Permanent staff</b>		
Full professors and similar positions	0	9
Assistant professors and similar positions	7	6
Full time research directors (Directeurs de recherche) and similar positions	1	1
Full time research associates (Chargés de recherche) and similar positions	4	4
Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.")	1	5
High school teachers	0	0
Supporting personnel (ITAs, BIATSSs and others, notably of EPICs)	4	4

<b>TOTAL permanent staff</b>	<b>26</b>	<b>29</b>
<b>Non-permanent staff</b>		
Non-permanent professors and associate professors, including emeritus	0	
Non-permanent full time scientists, including emeritus, post-docs	3	
Non-permanent supporting personnel	1	
PhD Students	4	
<b>TOTAL non-permanent staff</b>	<b>7</b>	
<b>TOTAL unit</b>	<b>33</b>	

## GLOBAL ASSESSMENT OF THE UNIT

During the evaluated period, the B2OA has developed a high-level research work covering a very broad and translational spectrum in the field of osteoarticular and bone tissue engineering. The committee can distinguish several fields of activity including fundamental aspects on stem cell biology, analysis of implant interfaces and osteolysis, development of innovative scaffold for maintaining in vivo cell survival and functions, high resolution X-ray bioimaging multiscale methods for bone tissue analysis, diagnosis and prediction of osteoarticular pathologies. The unit, mainly composed of biologists and clinicians, develops a highly innovative pluridisciplinary and translational research, conducted with a strong commitment of the clinicians of the unit.

This pluridisciplinary research is obviously a very strong asset of the unit, which proves to be an excellent research-training environment for the many doctoral students and post-docs of the unit.

During the contract, the Unit has improved both quality and quantity of the publications as well as the patent production.

The national grant applications were exceptionally successful, while other financial supports were obtained from private institutions, foundations or companies. However, the integration of the Unit in European Research programs remains limited; it should be improved in the future through the collaborative network set up with European groups.

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2 rue Albert Einstein  
75013 Paris, France  
T. 33 (0)1 55 55 60 10

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