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## LNIA - Neurosciences intégratives et adaptatives

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:

Laboratory of Integrative and Adaptive Neurosciences

LNIA

under the supervision of  
the following institutions  
and research bodies:

Aix-Marseille Université

Centre National de la Recherche Scientifique - CNRS

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>*

Josef Syka, 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:** Laboratory of Integrative & Adaptive Neurosciences

**Unit acronym:** LNIA

**Label requested:** UMR

**Current number:** 7260

**Name of Director  
(2016-2017):** Mr Christian XERRI

**Name of Project Leader  
(2018-2022):** Ms Béatrice ALESCIO-LAUTIER

## Expert committee members

**Chair:** Mr Josef SYKA, Institute of Experimental Medicine AS CR, Czech Republic

**Experts:** Mr Jean-Christophe COMTE, Faculté de médecine, Lyon (representative of supporting personnel)

Mr Jean-Louis GUILLOU, Université de Bordeaux (representative of the CNU)

Mr Rafael LABOISSIÈRE, Université Grenoble Alpes (representative of the CoNRS)

Mr Daniel SHULZ, CNRS Gif-sur-Yvette

**Scientific delegate representing the HCERES:**

Mr Christian GIAUME

**Representatives of supervising institutions and bodies:**

Mr Pierre CHIAPETTA, Aix-Marseille Université

Mr Bernard POULAIN, CNRS

**Head of Doctoral School:**

Mr Philippe NAQUET, ED n° 62, École Doctorale « Sciences de la Vie et de la Santé »

## 1 • Introduction

### History and geographical location of the unit

Originally, during the 2008-2012 term, the Laboratory of Integrative and Adaptive Neurosciences (LNIA), which was labelled as UMR 6149, was composed of 8 research teams. In order to strengthen the scientific coherence within the laboratory, promote new synergies and innovative cooperation and to facilitate cross-fertilization of expertise, for the 2012-2016 period, a reorganization was driven by the director and supported by a large consensus. Selective streamlining based on a refocusing of the research topics resulted in restructuring the laboratory, labelled as UMR 7260, into 2 large teams.

The Laboratory of Integrative and Adaptive Neurosciences (LNIA) is a research unit jointly administered by the CNRS and Aix-Marseille University (AMU) that is located on the Saint-Charles campus in the centre of Marseille. LNIA is part of Fédération 3C “Comportement, Cerveau, Cognition” (Behavior, Brain, Cognition, director: Mr Thierry HASBROUCQ), which includes three research units working in the area of cognitive and integrative neuroscience. LNIA consists of two teams: “Sensory Processing and Neuroplasticity” (team leader: Mr Arnaud NORENA) and “Body and Cognition” (team leader: Ms Béatrice ALESCIO-LAUTIER).

### Management team

The unit is currently directed by Mr Christian XERRI.

### HCERES nomenclature

- SVE2 Biologie Cellulaire, Imagerie, Biologie Moléculaire, Biochimie, Génomique, Biologie Systémique, Développement, Biologie Structurale;
- SVE4 Neurologie;
- SVE5 Physiologie, Physiopathologie, Cardiologie, Pharmacologie, Endocrinologie, Cancer, Technologies Médicales.

### Scientific domains

Neuroscience, neurophysiology, neuroanatomy, behaviour, sensory physiology.

Key words: sensory systems, motor control, perception, cognitive functions, recovery and rehabilitation.

## Unit workforce

Unit workforce	Number on 30/06/2016	Number on 01/01/2018
N1: Permanent professors and similar positions (2 Associate Professor not included)	7	5
N2: Permanent researchers from Institutions and similar positions	13	13
N3: Other permanent staff (technicians and administrative personnel)	8	9
N4: Other researchers (Postdoctoral students, visitors, etc.)	6	
N5: Emeritus	0	
N6: Other contractual staff (technicians and administrative personnel)	2	
N7: PhD students	8	
<b>TOTAL N1 to N7</b>	<b>44</b>	
Qualified research supervisors (HDR) or similar positions	18	

Unit record	From 01/01/2011 to 30/06/2016
PhD theses defended	8
Postdoctoral scientists having spent at least 12 months in the unit	6
Number of Research Supervisor Qualifications (HDR) obtained during the period	7

During the evaluated period this unit was composed by 2 teams. For the future 5 years the director proposes to reorganize the unit into 4 teams. The tables of the new team forces will be indicated in the team by team analysis while below the tables refer to the 2 teams of the evaluated period.

<b>Body and Cognition</b>	<b>Number on 30/06/2016</b>	<b>Number on 01/01/2018</b>
<b>N1:</b> Permanent professors and similar positions (1 Associate Professor not included)	2	
<b>N2:</b> Permanent researchers from Institutions and similar positions	8	
<b>N3:</b> Other permanent staff (technicians and administrative personnel)	0	
<b>N4:</b> Other researchers (Postdoctoral students, visitors, etc.)	2	
<b>N5:</b> Emeritus		
<b>N6:</b> Other contractual staff (technicians and administrative personnel)		
<b>N7:</b> PhD students	4	
<b>TOTAL N1 to N7</b>	<b>16</b>	
Qualified research supervisors (HDR) or similar positions	9	

<b>Unit record</b>	<b>From 01/01/2011 to 30/06/2016</b>
PhD theses defended	4
Postdoctoral scientists having spent at least 12 months in the unit	2
Number of Research Supervisor Qualifications (HDR) obtained during the period	4

<b>Sensory Processing and Neuroplasticity</b>	<b>Number on 30/06/2016</b>	<b>Number on 01/01/2018</b>
<b>N1:</b> Permanent professors and similar positions (1 Associate Professor not included)	6	
<b>N2:</b> Permanent researchers from Institutions and similar positions	6	
<b>N3:</b> Other permanent staff (technicians and administrative personnel)		
<b>N4:</b> Other researchers (Postdoctoral students, visitors, etc.)	4	
<b>N5:</b> Emeritus		
<b>N6:</b> Other contractual staff (technicians and administrative personnel)	2	
<b>N7:</b> PhD students	4	
<b>TOTAL N1 to N7</b>	<b>22</b>	
Qualified research supervisors (HDR) or similar positions	9	

<b>Team record</b>	<b>From 01/01/2011 to 30/06/2016</b>
PhD theses defended	4
Postdoctoral scientists having spent at least 12 months in the unit	4
Number of Research Supervisor Qualifications (HDR) obtained during the period	3



## 2 • Assessment of the unit

### Global assessment of the unit

Main research aims of the unit during the period 2011-2016 were to obtain new insights into sensory and cognitive processes, while stressing their interactions, as well as into adaptive neuroplasticity following injury, functional recovery and rehabilitation. The research was focused on neural substrates of the sensory percept formation, experience-dependent plasticity in the normal auditory and somatosensory systems, neural plasticity and functional recovery of sensory systems following peripheral or central injury, multisensory integration and its contribution to self-consciousness, on bodily and extra-personal space representations and cognitive dysfunction and on functional rehabilitation. These topics were investigated in healthy humans and animals as well as in several models of ageing and common brain diseases - brain trauma, stroke, and sensory deficits - with potentially strong impact on population health. In addition to the theoretical outcomes of the research conducted in the laboratory, several lines of research were aimed at developing new treatments, such as new drugs, sensorimotor rehabilitation strategies and cognitive training.

As the positive outcome of merging the 8 previously existing teams, one can mention the new strength of the LNIA to address topical research questions by merging classical techniques spanning molecular biology, biochemistry, histology, electrophysiology, and behavioural and cognitive analysis with more recent techniques and methods such as optical imaging, functional connectivity and diffusion tensor imaging.

The evaluated 5-year period of integrative work undoubtedly brought essential benefits, yet some of the recommendations of the 2011 evaluation were not fulfilled. This concerns mainly less developed collaborations with the foreign institutions, particularly from abroad, almost non-existing support from European grants (the unit did not get so far any grant from the European Research Council) and low enrolment of new PhD students connected with a not so high number of PhD dissertations.

During the evaluated term, a substantial growth in the number of researchers, a diversification of research topics, as well as a strong synergy, both intra- and inter-team, has prompted the members of the laboratory to consider new changes in the organization. As of January 2018, the LNIA is proposed to be reorganized in 4 teams instead of 2 teams. This change will also promote new leadership positions. The reorganization into 4 teams is intended to enhance the laboratory's worldwide visibility. Each team will dispose of complementary knowledge and expertise in the fields of unimodal and multimodal sensory integration (auditory, somatosensory, vestibular and visual) and its interaction with cognition. In accordance with these changes, it is proposed that the laboratory will be renamed as laboratory of Sensory and Cognitive NeuroSciences (SCN).

One of the main aims of the reorganization is to enable new synergies fostering collaborative projects and promoting the emergence of transversal research topics. The four proposed research teams share a strong interest in ageing, plasticity following brain injuries (traumatic brain injury, cortical ischemia), vestibular dysfunction and hearing loss. The study of these pathological models strengthens the links between fundamental and clinical research. This essential partnership of the unit with clinicians will benefit from the interlinking of the sensory and cognitive domains. The new research organization is planned to reinforce the capacity to deal with major health and societal challenges through the search for novel therapeutics, biomarkers and ways to improve rehabilitation strategies. In addition, the scientific focus of the future laboratory is planned to be fully integrated within the overall strategies and policies of the restructuring of Neurosciences in Aix-Marseille University.