Laboratoire de Neurosciences intégratives et cliniques

Rapport Hcéres

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

HCERES report on research unit:

Laboratory of Integrative and Clinical Neuroscience

LICN

Under the supervision of the following institutions and research bodies:

Université de Franche-Comté - UFC

Evaluation Campaign 2015-2016 (Group B)

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

In the name of HCERES,[1]

Michel COSNARD, president

In the name of the experts committee,[2]

Chris BAEKEN, chairman of the committee

Under the decree No.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 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 and Clinical Neuroscience
Unit acronym:	LINC
Label requested:	EA
Current number:	481
Name of Director (2015-2016):	Mr Emmanuel HAFFEN
Name of Project Leader (2017-2021):	Mr Emmanuel HAFFEN

Expert committee members

Chair:	Mr Chris BAEKEN, Department of Psychiatry and Medical Psychology, Ghent, Belgium
Experts:	Ms Martine CADOR, Université de Bordeaux
	Mr François MAUGUIERE, Université Claude Bernard Lyon (representative of CNU)

Scientific delegate representing the HCERES:

Mr Jacques NOËL

Representative of supervising institutions and bodies:

Mr Jacques BAHI, Université de Franche-Comté

Head of Doctoral School:

Mr Thierry RIGAUD, Doctoral school n° 554, Environnements, Santé

1 • Introduction

History and geographical location of the unit

The research team, Laboratory of Integrative and Clinical Neurosciences (LICN) (EA481 or 'Équipe d'Accueil' 481) exists since 1996. It was originally composed of university professors and lecturers in the domains of biology and physiology, interested in neuroscience research focused on olfactory perception in animals and humans interacting with psychiatric and/or neurological problems. This was in the field of medical and health research at the University of Franche-Comté. Since 2008, the EA481 fruitfully integrated researchers and research professors from two university faculties: Faculty of Science and Techniques and Faculty of Medical and Pharmaceutical Sciences. Following the AERES evaluation in 2011, a midterm evaluation visit was hold in 2014 by a panel of scientists invited by the university. This led to a change in the unit's direction, with Mr Emmanuel HAFFEN superseding the former director, Mr Jean-Louis MILLOT. When the new director took on the unit in 2014, the lines of research were reformulated around two themes: 1. Decision making – Reward, and 2. Perception – Hedonia.

In June 2015, the EA481 assembled hospital-university professors and lecturers (psychiatrists, neurologists, radiologists, anatomists and geneticists …) and full-time researchers. On January 1st, 2017, members from the EA3922 'Estrogen, gene expression and pathologies of the central nervous system' will join the unit to bring preclinical models on feeding behaviour.

The LICN is located at the faculty of Sciences and techniques, at the University of Besançon. The LICN is one of the units of the federative research structure (Structure Fédérative de Recherche - SFR) SFR FED 4234 INSERM - Cellular and Tissular engineering and biology.

Management team

Mr Emmanuel HAFFEN is the director of the unit since the mid-term evaluation in 2014. Mr Jean-Louis MILLOT was the previous director of the unit.

HCERES nomenclature

SVE1_LS5 Neurosciences

Scientific domains

The LICN conducts research in two thematic areas: 1. Decision making – Reward and 2. Perception – Hedonia. The LICN is focused on the development and evaluation of new diagnostic and therapeutic methods and on the understanding of pathophysiological mechanisms in various pathologies including, mood disorders and neurodegenerative diseases, cerebrovascular pathologies, genetic disorders with cognitive repercussion, conduct attachment disorders.

Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	17	27
N2: Permanent researchers from Institutions and similar positions	5	5
N3: Other permanent staff (technicians and administrative personnel)	3	10
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)		
N6: Other contractual staff (technicians and administrative personnel)	8	
N7: PhD students	9	
TOTAL N1 to N7	**42**	
Qualified research supervisors (HDR) or similar positions	11	

Unit record	From 01/01/2010 to 30/06/2015
PhD theses defended	15
Postdoctoral scientists having spent at least 12 months in the unit	1
Number of Research Supervisor Qualifications (HDR) obtained during the period	1

2 • Overall assessment of the unit

Introduction

According to the recommendations of the AERES in March 2011 the scientific objectives of the LICN have been restructured under two major headings: 1) Decision making and reward, 2) Hedonic - Perception. This scientific re-orientation has been brought about in 2014 by a midterm evaluation of the 2010-2015 contracts by a scientific panel invited by the University of Besançon. This reorganization has been a major step for the unit.

Theme 1: Decision making-Reward. Decision-making is altered in several pathologies such as psychiatric diseases (mood disorders, eating disorders, addictions, etc.) and neurological diseases (neurodegenerative diseases, stroke, multiple sclerosis). This axis concerns the study of the pathophysiological mechanisms of decision-making and some of its components using in vivo studies, pre-clinical and clinical studies with subjects or patients (depressed patients, movement analysis in subject). This theme is using different tools (Electrophysiology Electroencephalography [EEG], Functional Magnetic Resonance Imaging [FMRI] and Positron Emission Tomography Scan [PETScan], olfactory measurement, movement analysis, visual tracking, and evaluation of inflammation mechanisms) and the effect and mechanisms of action of Non-Invasive transcranial Stimulation (NIBS) techniques (repeated Transcranial Magnetic Stimulation [rTMS], transcranial Direct-Current Stimulation [tDCS]). An exploration of the cortico-subcortical network anomalies (limbic system, prefrontal cortex), to better understand the pathophysiology of the disease, is proposed and validate the use of non-invasive techniques of transcranial stimulation as therapeutic tools.

Theme 2: Hedonic-Perception. This thematic axis uses a multidisciplinary and translational approach from animal models to healthy controls subjects and patients with neuropsychiatric illnesses. The committee emphasizes that the unit's originality lies in the choices of emotional stimuli, such as odours, or the modelling / manipulation of generating precise sources of emotions. The LICN relies here on its behavioural, electrophysiological and immunohistochemical expertise.

Global assessment of the unit

The LICN gathers most, if not all, of the neuroscientists working in the hospital and the university environment in Besançon. As mentioned before, the LICN in its current form is built around 2 already promising research themes. The first theme consists of an original angle on 'decision making reward', which concerns the translational evaluation of neurostimulation techniques (rTMS and tDCS). The second theme (Hedonic – Perception) consists of another translational and proven fruitful model of research on emotional responses to olfactory and gustatory stimuli. The interactions between the two research themes reveal already that for the past five years not only the number, but also the scientific quality, of the publications have significantly increased. Funding seems solid and research collaborations involve other research teams at the local, national and international level. The LICN clearly makes efforts to promote national and international scientific collaboration.

Strengths and opportunities in the context

One of the strengths of LICN is the access to research platforms, which have been structured over the five past years and cover all of the methodologies requested to achieve the scientific program: Genomics and histopathology, Brain imaging, Electrophysiology, Non-invasive brain stimulation, Movement analysis and eye tracking and Animal facility. The association with specialists in neuro- and psychopathology for axis 1 and for axis 2 looks optimal to lead and coordinate the research activity of each axis according to their specific objectives. The numbers of engineers and support increased as requested.

One of the strongest opportunities of the LICN is the possibility to work around with translational models of neuro/psychopathology within the different strong areas of expertise. In this line, the combination with NIBS (Non-Invasive Brain Stimulation) techniques is not only a strength but also a major opportunity to understand brain function and to develop treatment algorithms for neuropsychiatric diseases. Furthermore, the favourable positioning of the LICN in translational research - in particular with the industrial world (COVALIA, DIXI-Microtechnique, etc.) - should promote interactive doctoral and postdoctoral training with engineers, science and technology, human and social sciences.

Weaknesses and threats in the context

In terms of human resources, on one hand, a researcher is retiring and another full-time researcher is envisaged to join the team; on the other hand, the unit is going to host several new associate professor members. Both changes will be a challenge for adaptation and integration. A more accurate description of who will do what would be welcome. Although the large number of new researchers seems to be distributed between the two research axes, how exactly this integration will affect the development of the existing research themes is not optimally defined yet.

Recommendations

Although the creation of the two research axes is a good and clever choice, the committee feels that future projects may benefit from an optimal collaboration among team members. This will be of special importance when the new research members will join the LICN. To optimally prepare for this new organisation, the axis supervisors may do well to clearly define the place of these new members within their teams according to their specific scientific projects. This organization is not clearly identifiable yet, but is of major importance.

Currently, the relevant scientific output of the LICN is difficult to assess because a large part of the publication list does not fit to the two research axes, but rather reflects the scientific production of individual team members in their own field of expertise. The EA481 may do well for its visibility by clearly distinguishing the two themes of research.