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## DevAH - Développement, adaptation et handicap

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:

Development, Adaptation and Handicap

DevAH

Under the supervision of the following  
institutions and research bodies:

Université de Lorraine

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>*

Naima Deggouj, chairwoman 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:** Development, Adaptation and Handicap

**Unit acronym:** DevAH

**Label requested:** EA

**Current number:** 3450

**Name of Director (2016-2017):** Mr Philippe PERRIN

**Name of Project Leader (2018-2022):** Mr Philippe PERRIN

## Expert committee members

**Chair:** Ms Naima DEGGOUJ, Cliniques Universitaires Saint-Luc, Belgium

**Experts:** Mr Olivier CLARIS, Université de Lyon, CHU Lyon (representative of the CNU)

Mr Thierry PAILLARD, Université de Pau et Pays de l'Adour

Mr Charalambos PAPAXANTHIS, Université de Bourgogne

Mr Xavier MARECHAL, Université de Lille

**Scientific delegate representing the HCERES:**

Ms Florence PINET

**Representative of supervising institutions and bodies:**

Mr Frederic VILLIERAS, Université de Lorraine

**Head of Doctoral School:**

Mr Patrick MENU, Doctoral School n° 266 "Biologie, Santé, Environnement"

## 1 • Introduction

### History and geographical location of the unit

As reported in the HCERES evaluation of February 2012, the Research Unit (RU) EA 3450 DevAH "Development, Adaptation and Handicap" resulted from the fusion of 2 teams: RU EA 3450 concerned by the developmental physiology of the respiratory control and bronchomotricity and the part of RU Inserm U 954 concerned by the development and maturation of the postural control, equilibration and motricity. The RU is working on the development of respiratory, sensorimotor and postural controls, as well as their adaptations to challenging individual or environmental conditions: in pathologies like prematurity, scoliosis, vestibular disorders, dyslexia, neurological disorders, amputation, in pollution, or in high-level sporting activities. This multidisciplinary team developed translational approaches on human and animal models. The team gathers confirmed scientists and physicians, from different specialties. They host, in academic and clinical facilities, young physicians and scientists for academic training.

EA 3450 DevAH is located in the Laboratory of Physiology at the Faculty of Medicine in Vandoeuvre-lès-Nancy.

### Management team

The director of the RU is Mr Philippe PERRIN.

During the contract 2013-2017, the RU was steered by a management board "G3", constituted of the director of the research unit and the head of each of the 2 axes, and by a "G11" laboratory council constituted of a BIATTS member, a PhD student and 9 researchers: the director of the EA 3450 of the contract 2009-12, the director of the current contract, the main sections of the "National Council of the Universities" (CNU) and of the hospital departments (university hospital, regional maternity, regional institute of rehabilitation) are so also represented as well as two of the concerned departments of the university (Faculty of Medicine and Faculty of Sport Sciences).

### HCERES nomenclature

SVE5: Biology, medicine and health

### Scientific domains

The RU is developing fundamental, applied and clinical researches in respiratory and sensorimotor fields: study of integrated functions and regulations during the development, study of development anomalies leading to motor or respiratory disability. The unit develops and use various technical facilities accessible to the unit members (such as an animal facility in the Faculty of Medicine for functional respiratory, motor, balance on one hand, and explorations in adults and children on the other hand on the hospital sites, following the requirements for research authorization by the ARS (Regional Agency for Health), and has access to large patient cohorts like premature infants, subjects with scoliosis, and/or neurological disorders, amputation or patients followed by centers of reference for rare diseases. The goal of the RU is to gain knowledge about the mechanisms of respiratory regulation and motor control. The acquired knowledge is used to develop new methods of functional explorations of pathologies.

Keywords: integrative physiology, health, ventilation, motricity, handicap.

## Unit workforce

| Unit workforce   | Number on 30/06/2016 | Number on 01/01/2018 |
|--|----------------------|----------------------|
| N1: Permanent professors and similar positions                         | 25                   | 26                   |
| N2: Permanent researchers from Institutions and similar positions      | 1                    | 1                    |
| N3: Other permanent staff (technicians and administrative personnel)   | 9                    | 13                   |
| N4: Other researchers (Postdoctoral students, visitors, etc.)          |                      |                      |
| N5: Emeritus   | 1                    |                      |
| N6: Other contractual staff (technicians and administrative personnel) | 3                    |                      |
| N7: PhD students   | 5                    |                      |
| TOTAL N1 to N7   | 44                   |                      |
| Qualified research supervisors (HDR) or similar positions              | 18                   |                      |

| Unit record   | From 01/01/2011 to 30/06/2016 |
|---|-------------------------------|
| PhD theses defended   | 6                             |
| Postdoctoral scientists having spent at least 12 months in the unit           | 1                             |
| Number of Research Supervisor Qualifications (HDR) obtained during the period | 2                             |

## 2 • Assessment of the unit

### Global assessment of the unit

The general research themes of the Research Unit (RU) are interesting. They concern the respiratory and/or sensorimotor control in challenged conditions: challenges produced by pathologies, by environmental conditions or by unusual body use. The major results obtained concern the development and validation of a new vestibular vibratory test, the test of Dumas, a better understanding of the postural control or of the pathophysiology of exercise-induced bronchoconstriction and of cough in extremely preterm children.

The scientific production during the last contract is good both quantitatively and qualitatively: RU members published 272 papers.

The RU has acquired a national and international recognition and notoriety, notably by the numerous invitations of its members to scientific meetings or to reviewing activities. The RU has obtained several regional and national research contracts. It is strongly involved in training through research both at the level of master and PhD degrees. It attracts young scientists and master students. The RU organisation is coherent. It is supported by the university and the hospital.

With regard to the last evaluation report: the coherence and visibility of all the projects are comparable, the translational aspect of the research is improved, the co-working with local, national or international scientific teams is more developed, the integration of the research in the social needs and networks is developing, and more PhD students are formed.

The RU has developed a good expertise on the different themes proposed for the future contract. The unit has chosen to develop the 3 following research themes:

- environment and adaptations: aims of theme 1 are as follows: i) to clarify the mechanisms of physiological response to different environments; ii) to study the pathophysiologic mechanisms leading to non-adaptative responses according to environment; and iii) to study foetal and infant origins of adult diseases by identification of the impact of the environment;
- exercise, training and performance: the main objective is to understand the mechanistic and functional bases of motor skills and the effect of intervention strategies through the identification of sport performance factors, of the determinants of injury, and of exercise-diseases interaction;
- disability and mechanisms of compensation: research projects are in the field of motor control to illustrate compensatory mechanisms as adaptive mechanisms to reduce disability as a consequence of any impairment.

Some of the required cohorts of patients already do exist. International collaboration is planned, based on existing links and co-publications. The global project is coherent and consistent.

Overall, the RU has reached a very good level during the last contract. However some aspects, notably the scientific production and the international appeal, could be further improved.

The international appeal of the whole RU has not increased enough during the last contract (for example: more post-doctoral students and more participation in european or international projects could be expected). The research theme of the unit, rather dispersed, does not help to its international visibility as a whole RU.

The RU integration in the economic and cultural environment is rather limited. The financial support of the university was low. The extra-hospital financial resources were not sufficient to improve the full-time scientific implication of young researchers in the RU. The functioning rules of the G4 must be formalised.