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## BIO-PEROXIL - Biochimie du péroxysome, inflammation et métabolisme lipidique

Rapport Hcéres

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# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

HCERES report on research unit:

Biochemistry of the peroxisome, Inflammation and Lipid  
metabolism

Bio-PeroxiL

Under the supervision of the following  
institutions and research bodies:

Université de Bourgogne - UB

# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

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

Michel Cosnard, president

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

Marc Poirot, 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:	Biochemistry of the peroxisome, Inflammation and Lipid metabolism
Unit acronym:	Bio-peroxIL
Label requested:	EA
Current number:	EA 7270
Name of Director (2015-2016):	Mr Gerard LIZARD
Name of Project Leader (2017-2021):	Mr Gerard LIZARD

## Expert committee members

Chair:	Mr Marc POIROT, Inserm, Toulouse
Experts:	Ms Liliane BERTI, University of Corse (CNU representative) Mr Marc ENGELEN, Academisch Medisch Centrum, Amsterdam, The Netherlands Mr Marc FRANSEN, University of Leuven, Belgium
Scientific delegate representing the HCERES:	Mr Jean GIRARD
Representative of supervising institutions and bodies:	Mr Jean GUZZO, University of Burgundy
Head of Doctoral School:	Mr Thierry RIGAUD, ED n° 554 « Environnements-Santé »

## 1 • Introduction

### History and geographical location of the unit

The EA 7270 unit was created on the January 1<sup>st</sup> 2012 and is headed by Mr Gerard LIZARD. This unit is an extension of the team n°9 (“Metabolic and Nutritional Biochemistry”), previously directed by Mr Norbert LATRUFFE, from the Inserm center U 866. The unit is located at the faculty of sciences “Gabriel” of Dijon. The unit is composed of about 50 people including 14 permanent researchers/teachers.

### Management unit

The unit will be managed by the current director Mr Gerard LIZARD. A management committee composed of the four theme leaders will decide on the progression and on the strategic orientation of the unit four times a year.

### HCERES nomenclature

SVE1\_LS1 Biologie moléculaire et structurale, biochimie

### Scientific domains

The scientific domains are related to the study of peroxisome organelles in the context of lipid metabolism, mainly in the pathogenesis of peroxisomal disorders, secondly on neurodegenerative diseases. The unit covers basic research as well as pharmacological and clinical aspects in these fields. The unit proposes the exploration of novel lipid biomarkers of the pathogenesis as well as the identification of new natural inhibitors of new pharmacological targets in these diseases.

### Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	8	7
N2: Permanent researchers from Institutions and similar positions	1	4
N3: Other permanent staff (technicians and administrative personnel)	4	4
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)	1	
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)		
N6: Other contractual staff (technicians and administrative personnel)	4	
N7: PhD students	5	
TOTAL N1 to N7	23	
Qualified research supervisors (HDR) or similar positions	6	

Unit record	From 01/01/2010 to 30/06/2015
PhD theses defended	8
Postdoctoral scientists having spent at least 12 months in the unit	
Number of Research Supervisor Qualifications (HDR) obtained during the period	

## 2 • Overall assessment of the unit

### Introduction

The unit is one of the only few french units studying the organelle peroxisome in collaboration with national and international networks. The research of the unit is composed of both fundamental and clinical approaches. With the creation of the EA 7270, and according to the remarks of the previous AERES expert committee, the theme was focused on lipids with regards to peroxisomal metabolism in the context of peroxisomal disorders.

The unit is structured in 4 themes. It includes 14 members including 1 CR Inserm, 4 professors, 1 emeritus professor, 4 associate professors (with a total of 6 HDR), 1 research engineer, 1 research technician, and 2 technical assistants (including 1 at 20%).

The molecular origin of peroxisomal disorders with neurological involvement is the federating topic of the four themes, in which different though complementary activities are developed:

- theme 1: biochemical and structural aspects of peroxisomal ABC transporters;
- theme 2: roles of the peroxisomal enzyme ACOX-1 in inflammation and oxidation;
- theme 3: impact of the peroxisomal enzyme COT in the peroxisomal  $\beta$ -oxidation of fatty acids;
- theme 4: relationship between peroxisome-neurolipotoxicity and lipid biomarkers of neurodegeneration.

To improve its research activity, the EA 7270 unit recruited a research technician and an associate professor in 2011. An associate professor of the unit was promoted to full professorship in 2012. The scientific production is very good for a small unit and proves its exceptional dynamism.

By focusing its research program on the peroxisome, the unit is very well interfaced with the local and regional actors. The structuration of the unit in 4 themes is relevant. Moreover, the unit is decidedly positioned in the field of academic fundamental research and strongly interacts with clinical institutions. The unit is also invested massively in training through research, which is reflected by the large number of students of various levels (junior high/high-school, vocational, bachelor, master, PhD and post-doctoral) hosted in the laboratory. This strong implication in training through research is explained by the large proportion of teacher to researchers in the unit (70%) from the UFR "Science Vie, Terre et Environment". The members of EA 7270 are also strongly involved, at various levels, in the life of the university (Boards, Commissions, management of teacher training). In addition, the members of the unit are also very active in interacting with the socio-economic and cultural environment.

### Global assessment of the unit

The team is composed of a laboratory director who heads a team of 14 permanent position persons, 9 of them being assistant professors or professors. The team has been joined by neurologists, which will give new opportunities of translational research, on peroxisomal defects-related diseases that include neurodegenerative diseases, and of fund raising for the unit. The laboratory has published a significant number of good publications in its field of expertise and had the opportunity to write review articles, present its work in international meetings as well as in social and economical instances.

### Strengths and opportunities in the context

This unit has developed an original research on “peroxisomes” and importantly, neurologists from Dijon’s Hospital will join the unit to develop translational research programs on peroxisomal defects-related neurological diseases. This unit shows complementary skills between groups, establishing a good cohesion. The unit shows a very good synergy between education and research, and a very good dynamism in the participation in projects promoting international networks of experts in lipid metabolism. The unit has acquired high performance equipment.

### Weaknesses and threats in the context

The unit is not attached to a national research organism, which makes it more difficult to obtain grants and private contracts on the peroxisome theme, and interactions with clinical teams were limited.

### Recommendations

The expert committee recommends measures to increase the stability of this group of researchers of remarkable dynamism. We recommend that the unit continues to work on lipid metabolism in peroxisomal disorders, which will improve the scientific identity of the laboratory at the national and international levels, and, to this end highly recommends a strategic analysis of research complementarities and funding. The expert committee strongly recommends that the unit try to achieve a better balance between research and scholarly activities.