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## **BMSSI - Bases moléculaires et structurales des systèmes infectieux**

Rapport Hcéres

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# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

HCERES report on research unit:

Structural and Molecular Basis of Infectious Systems

BMSSI

Under the supervision of  
the following institutions  
and research bodies:

Université Claude Bernard Lyon 1 - UCB

Centre National de la Recherche Scientifique - CNRS

Institut National de la Santé Et de la Recherche

Médicale - INSERM

# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

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

Didier HOUSSIN, president

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

Robert TAMPÉ, chairman of the committee

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Under the decree N°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 result of the evaluation by the experts committee, the composition of which is specified below.

The assessments contained herein are the expression of an independent and collegial deliberation of the committee.

Unit name:	Structural and Molecular Basis of Infectious Systems
Unit acronym:	BMSSI
Label requested:	UMR
Present no.:	UMR 5086
Name of Director (2014-2015):	Mr Gilbert DELÉAGE
Name of Project Leader (2016-2020):	Mr Jean-Michel JAULT

## Expert committee members

Chair:	Mr Robert TAMPÉ, Biocenter, Goethe University Frankfurt, Germany
Experts:	Mr Frédéric BARRAS, LCB, Université Aix-Marseille-CNRS, Marseille
	Ms Sandrine BOSCHI-MULLER, Université de Lorraine, Vandœuvre-les-Nancy (representative of the CoNRS)
	Mr Jean CAVARELLI, IGBMC, Université de Strasbourg, Illkirch
	Mr Alain FILLOUX, Imperial College London, UK
	Mr William HUNTER, College of Life Sciences, University of Dundee, Scotland, UK
	Mr Gilles LALMANACH, Université François Rabelais, Tours (representative of the CNU)
	Mr Nico VAN NULAND, Structural Biology Brussels, Vrije Universiteit Brussel, Belgium

Scientific delegate representing the HCERES:

Ms Catherine SCHUSTER

## Representatives of the unit's supervising institutions and bodies:

Ms Emmanuelle CANET-SOULAS (representative of the Doctoral School EDISS N°205 )

Mr Frédéric FAURE, CNRS

Mr Pierre-Germain GILLET, University Claude Bernard Lyon 1

Mr Jean-Claude MICHALSKI, INSB

Mr Bruno MIROUX, CNRS

## 1 • Introduction

### History and geographical location of the unit

The research unit “Molecular and Structural Bases of Infectious Systems” (BMSSI) is located at the Gerland site of Lyon. BMSSI is one of the two research entities that compose the “Institute of Biology and Chemistry of Proteins” (IBCP) at the Gerland Campus (South of Lyon city), the other being the unit “Laboratory of Tissue Biology and Therapeutic Engineering (LBTI)”. The IBCP was built in 1990 under the direction of Mr Alain COZZONE. In 1999, the IBCP became a Mixed Research Unit (UMR) under the direction of Mr Alain COZZONE. The UMR was renewed in 2007 when Mr Gilbert DELÉAGE became the new director. In 2011, the UMR split in three different entities one became the “Federation of Research” (FR3302, head Mr Gilbert DELÉAGE), one BMSSI (head Mr Gilbert DELÉAGE) and one LBTI (head Mr Bernard VERRIER). Following two renovations IBCP now offers a surface of 5500 m<sup>2</sup> dedicated to research. The role of the FR is to administer the IBCP building and technological platforms. Apart from these two research units, the IBCP building hosts two companies (CALIXAR that was set up by a staff member of BMSSI and Adjuvatis), the “protein part” of the “Rhône-Alpes Pole of Bioinformatics” (PRABI) and the technical platforms devoted to protein biochemistry and managed by the Mixed Service Unit (UMS) 3444 (SFR BioSciences Lyon), which gathers 10 research units in south Lyon.

BMSSI is composed of nine teams (T1 to T9). Research focuses on the study of molecular mechanisms of infectious processes responsible for human diseases, dealing with Structural Biology, Molecular Microbiology, and Bioinformatics. Infectious model systems studied come from parasites, bacteria, and viruses. BMSSI is a unique research unit in Lyon with expertise in structural biology (X-ray crystallography, nuclear magnetic resonance spectroscopy, and structural bioinformatics).

During the last contract apart extension of the building, the direction of BMSSI launched an open call to hire the future new director (Mr Jean-Michel JAULT). Mr Jean-Michel JAULT has been the deputy head of BMSSI since 2014 and will be head of the unit for the next contract. Over the period, whereas new team leaders emerged internally (T1, T6), BMSSI attracted three new teams: The ATIPE Avenir team headed by Mr Laurent TERRADOT (T4) arrived in 2010, the team of Ms Suzana SALCEDO (T8) on a “new team chair program from FINOVI-RTRA” in 2012, and more recently in 2014, T9 headed by the new deputy head (Mr Jean-Michel JAULT). The main scientific interests of the new teams are focused on structural biology, bacteria-host interactions at the molecular level, and the design of new microbial therapeutic targets, respectively, fitting perfectly in the scope of the unit.

For the next contract over the nine teams forming BMSSI, one team T5 “Extracellular interaction networks” (headed by S. RICARD-BLUM) will leave BMSSI and it is proposed that Team 1 splits in two independent teams (T1 and T5). At the beginning of the next contract the majority of team leaders will have been renewed.

Geographically, BMSSI is ideally located in a very dynamic and rich scientific area, including the International Research Center for Infectiology (CIRI, 23 research teams), several multinational companies (MERIAL, SANOFI) and an exceptional portfolio of technological platforms some of them hosted at the IBCP (part of UMS 3444) as well as the P4 laboratory of Lyon.

### Management team

Current head: Mr Gilbert DELÉAGE: current deputy head: Mr Jean-Michel JAULT

Head for the new contract: Mr Jean-Michel JAULT

### HCERES nomenclature

SVE1\_LS1

SVE1\_LS6

## Unit workforce

<b>Unit workforce</b>	<b>Number as at 30/06/2014</b>	<b>Number as at 01/01/2016</b>
<b>N1:</b> Permanent professors and similar positions	13	7
<b>N2:</b> Permanent EPST or EPIC researchers and similar positions	17	17
<b>N3:</b> Other permanent staff (without research duties)	11 (9.4 FTE)	10 (9.2 FTE)
<b>N4:</b> Other professors (PREM, ECC, etc.)	3	
<b>N5:</b> Other researchers (DREM, Postdoctoral students, visitors, etc.)	11	10
<b>N6:</b> Other contractual staff (without research duties)	2	3
<b>TOTAL N1 to N6</b>	<b>57 (55.4)</b>	<b>47 (46.2)</b>

<b>Team workforce</b>	<b>Number as at 30/06/2014</b>	<b>Number as at 01/01/2016</b>
Doctoral students	22	
Theses defended	39	
Postdoctoral students having spent at least 12 months in the unit	24	
Number of Research Supervisor Qualifications (HDR) taken	1	
Qualified research supervisors (with an HDR) or similar positions	20	17

## 2 • Overall assessment of the unit

### Global assessment of the unit

The global assessment of the unit is very positive. The unit has started to develop into a dynamic, interdisciplinary center with very promising young group leaders and excellent research. The unit has responded well to the challenges in changes of the staff profile and has picked a clear direction forward. This includes successful recruitment of three very strong young investigators. The majority of the teams are internationally competitive, reflected by outreaching contributions. The overall topic of the research unit is well chosen and offers an excellent directional transition going from biochemistry to a transdisciplinary approach in infectious diseases and microbiology. The young investigators will provide the driving force for the future and set the standard. The unit has an ideal well-balanced gender politics.

### Strengths and opportunities in relation to the context

The unit was successful in refocusing on a collaborative team spirit. Young team leaders are seen as a new focal point of the unit. The new directorship was successful in shaping the fruitful environment for the new funding period.

Most of the research topics are well chosen and focused to be internationally competitive. The strengths in collaborations and successful funding mostly based on national sources are apparent. In the near future, excellent but partially unexplored chances are seen to strengthen the link with the University of Lyon. Young investigators should take the opportunity to team up with the University. Young team leaders may be encouraged to be involved in teaching at higher level. In essence, there is an optimal time point and real chance to create a strong long-term relationship with the universities. Moreover, more fruitful interaction and collaborations between the infectious biology units from Lyon and the research unit can be envisioned. Apart from notable external funding on national sources, international funding should be encouraged. Open access to the different platforms provides interesting opportunities. The genesis of new startup companies in the unit is specially acknowledged to strengthen the link between basic and applied research.

### Weaknesses and threats related to the context

The transition on a well-focused and international competitive program must be carried through to the staff. The objectives and missions need to be well communicated. Vertical and horizontal communication and transparency may strengthen the cohesion between teams. The successful momentum should be carried through all personnel layers of the unit. Some uncompetitive projects, which need refocusing, have to be identified by more rigorous internal self-evaluation. Careful consideration should be given to maintain and promote international, focused research projects. A better synergistic interaction between labs in structural biology and bioinformatics is recommended. An optimized redistribution of technical staff and work forces could be reconsidered. A deficiency in technical staff has been identified in some teams. Based on the overall excellent evaluation, the unit is encouraged to support the internationally highly competitive topics.

### Recommendations

Careful consideration should be given to maintain and promote internationally competitive research projects. Seek to improve vertical communication within the unit and understand the need for competitive research. Teaching and training tasks at the M1 and M2 level should be encouraged for all staff members. A new team leader in the field of structural biology could help the unit. The technical staff and work forces could be reinforced to support competitive topics and research groups. Some teams need to be closely directed in terms of focus and success. An increased degree of self-assessment in the productivity of the teams will help to increase the international visibility of the unit.