BRM - Bacterial regulatory RNAs and medicine (ARN régulateurs bactériens et médecine)

Rapport Hcéres

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

HCERES report on research unit:

Bacterial regulatory RNAs and Medicine

BRM

Under the supervision of the following institutions and research bodies:

Université de Rennes 1

Institut National de la Santé et de la Recherche Médicale - INSERM

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]	In the name of the experts committee,[2]
Michel Cosnard, president	Patrick Linder, 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:	Bacterial regulatory RNAs and Medicine
Unit acronym:	BRM
Label requested:	UMR
Current number:	835
Name of Director (2015-2016):	Mr Brice FELDEN
Name of Project Leader (2017-2021):	Mr Brice FELDEN

Expert committee members

Chair:	Mr Patrick LINDER, University of Geneva, Switzerland
Experts:	Ms Marie-José BUTEL, Paris Descartes University (representative of the CNU)
	Ms Marie-Cécile PLOY, University of Limoges (representative of the CSS INSERM)
Scientific delegate representing the HCERES:	
	Ms Catherine SCHUSTER
Representatives of supervising institutions and bodies:	
	Mr Claude LABIT, University of Rennes
	Ms Stéphanie POMMIER, Inserm
Head of Doctoral School:	Ms Nathalie THERET, Doctoral school n°92 “Vie-Agro-Santé - VAS”

1 • Introduction

History and geographical location of the unit

The unit "Bacterial regulatory RNAs and Medicine" UMR 385 has been renewed in 2011. It has its origins in the creation of a young research unit in 2000, headed by the current director Mr Brice FELDEN, that was recognised as it is today in 2006. The unit is located at the Medicine-Pharmacology-Odontology campus that is part of the UFR Pharmaceutical Sciences and Biology of the University of Rennes. The unit is located near Rennes University Hospital, which is important for the development plan as presented.

Management team

The unit is headed by Mr Brice FELDEN.

HCERES nomenclature

SVE1_LS1 Biologie moléculaire et structurale, biochimie

SVE1_LS6 Immunologie, microbiologie, virologie, parasitologie

SVE1_LS1 Biologie moléculaire et structurale, biochimie

SVE1_LS2 Génétique, génomique, bioinformatique

Scientific domains

The unit has a strong focus on bacterial infections with an emphasis on the opportunistic pathogen *Staphylococcus aureus*. The regulation of gene expression is central to the adaptation of this opportunistic pathogen to different growth conditions and it has been shown in pioneering work by this unit and by other groups that small regulatory RNAs play an important role in gene expression. The work in the unit is complemented by the clinical work of a clinician.

Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	6 (FTE 2.8)	8 (FTE 3.9)
N2: Permanent researchers from Institutions and similar positions		
N3: Other permanent staff (technicians and administrative personnel)	7 (FTE 5.8)	7 (FTE 5.8)
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	2	
N6: Other contractual staff (technicians and administrative personnel)		
N7: PhD students	3	
TOTAL N1 to N7	**18 (FTE 13.6)**	
Qualified research supervisors (HDR) or similar positions	2	

Unit record	From 01/01/2010 to 30/06/2015
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	

2 • Overall assessment of the unit

Introduction

The unit started with important work in trans-translation and then switched to the analysis of small regulatory RNAs. Small regulatory RNAs in bacteria play important roles in regulating gene expression, either positively or negatively. There are different types of sRNAs, such as transacting sRNAs that may act on different targets either by hybridisation or by interacting with regulatory proteins, antisense RNAs that regulate the complementary mRNA, or RNAs that act as riboswitches. The switch from trans-translation to the study of sRNAs has been fully and successfully confirmed in the recent period of evaluation and the subject has been consolidated. The unit has reported on the discovery of several small regulatory RNAs that control expression of virulence factors or the expression of bacterial toxin-antitoxin modules, which may play important roles in stress management and persistence.

Global assessment of the unit

The unit addresses a timely subject in an important pathogen. The subject is highly competitive, but the unit is clearly at the forefront. They have published several high impact publications with the head of the unit as senior author, have written reviews on the subject of regulatory RNAs. They have also been invited to international and competitive conferences and have ongoing collaborations with other laboratories in France or abroad. Through the reviews and the establishment of a *Staphylococcus aureus* sRNA database, the unit evolved to a reference center of small regulatory RNAs. The unit obtained 5 patents in the evaluation period, of which 2 are in further elaboration. The unit will be joined by two clinician researchers from the nearby Hospital. This new addition of medical microbiologist and infectiologist will allow the establishment of a fruitful translational research.

Strengths and opportunities in the context

The strength is certainly the combination of a strong fundamental research with an important clinical issue. The proximity to a Hospital is an advantage. The quality of the research is reflected by an excellent publication record and the international visibility of the unit and its director. The organisation of the unit and the training of students are good. Members of the unit are trained in skills for the evaluation of virulence factors.

Further fundamental research will contribute to the visibility of this unit and will further be strengthened by the presence of three physicians.

The head of the unit has initiated an “RNA club” to federate with other groups of similar interests. Invited seminars are organised and expose the members to new ideas and other research topics.

The strong wish to patent their work resulted in 5 patents, of which two are further developed.

Weaknesses and threats in the context

Attracting postdoctoral fellows would strengthen the unit, although this is not an easy task. Moreover the unit does not benefit of a full time researcher. However, for the next years, the University of Rennes offered to exempt the director of his teaching duty, allowing him to do full-time research.

The planned link to the clinic with the integration of physicians is important and will further strengthen the translational aspects of their research. However, it will be important that the physicians have sufficient time to really interact with the members of the unit, and not only with the head of the unit. Nevertheless, the fundamental research needs to be pursued.

Recommendations

The fact that all members of the unit are French speaking does not favour helding the weekly seminars in English, although this would be of great benefit for the students to get prepared for the participation at international meetings. The presence of foreign scientists would impose such a language change.

Participation at meetings is important for the junior scientists, and not only for PhDs students; and care should be taken that they learn to present their work to other scientists. The unit should develop an active strategy of career development.

As mentioned above, it is important to implement at best the integration of the physicians within the unit, but at the same time also continue strong fundamental research. Both are not trivial.

The opportunistic pathogen Staphylococcus aureus is an important human pathogen. In view of the One Health concept and the importance of animal farming in Bretagne, it may be important to develop new contacts with veterinary services. In respect to the small regulatory RNAs, it could be expected that the regulation of virulence factors is different.