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## GeRMO - Genomic and resistance of opportunistic microorganisms

Rapport Hcéres

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# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

HCERES report on research unit:

Genomic and Resistance of Opportunistic  
Microorganisms

GeRMO

Under the supervision of  
the following institutions  
and research bodies:

Université de Rennes 1

# 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>*

Michel Simonet, chairman of the committee

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Under the decree N<sup>o</sup>.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 result from the committee's the expression of an independent, collective and collegial reviewing by the committee.

Unit name:	Genomic and Resistance of Opportunistic Microorganisms
Unit acronym:	GeRMO
Label requested:	EA
Current number:	creation
Name of Director (2015-2016):	
Name of Project Leader (2017-2021):	Mr Samer KAYAL

## Expert committee members

Chair: Mr Michel SIMONET, Université de Lille (representative of the CNU)

Experts: Mr Thierry NAAS, Hôpital de Bicêtre, Paris

Scientific delegate representing the HCERES:

Ms Sophie EZINE

Representatives of supervising institutions and bodies:

Mr Eric BELLISSANT, Faculté de Médecine de Rennes

Mr Claude LABIT, Université de Rennes 1

Head of Doctoral School:

Ms Nathalie THERET, Doctoral School n° 92 « Vie-Agronomie-Santé, VAS »

## 1 • Introduction

### History and geographical location of the unit

GeRMO is a new research unit that emerged from the EA 1254 unit headed by Ms Martine BONNNAURE-MALLET at the Faculty of Odontology, which research is centered on the microorganisms of the oral cavity. In 2014, three EA 1254 members decided to found a new team focused on bacterial adaptation and evolution. Thanks to strong support from the University of Rennes 1 and the Faculty of Medicine, the emerging research group was temporarily affiliated with a “Unité de Recherche Universitaire” (university research unit) and administratively hosted to date by the UMR CNRS 6290 unit at the Institut de Génétique et de Développement de Rennes. GeRMO is located on the 2<sup>nd</sup> floor of the Faculty of Medicine and Pharmacy close to the hospital laboratory.

### Management team

GeRMO's head is Mr Samer KAYAL.

### HCERES nomenclature

SVE1\_LS6

### Scientific domains

Group A streptococci and enterococci, bacterial adaptation and evolution, genomics and post-genomics, and antibiotic resistance.

## Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	3	3
N2: Permanent researchers from Institutions and similar positions		
N3: Other permanent staff (technicians and administrative personnel)	4 (0.5 FTE)	5
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)		
N7: PhD students		
<b>TOTAL N1 to N7</b>	<b>7 (4.5 FTE)</b>	
Qualified research supervisors (HDR) or similar positions	3	

## 2 • Overall assessment of the unit

### Introduction

In 2010, GeRMO initiated a project on *Streptococcus pyogenes*, a group A *Streptococcus* (GAS), based on the broad range of expertise acquired by the group's three co-founders (two professors and an associate professor). Two research themes are being developed: (i) the genetic investigation of GAS populations from a collection of strains isolated during an epidemiological survey of clinical GAS infections in the Brittany region of France and (ii) the construction of a new mutagenesis system to generate hypermutations in bacteria (for use in studying streptococcal evolution).

Another research project, from the EA4655 at Caen that will join the group this year, is focused on characterizing the molecular mechanisms of emerging antibiotic resistance in *E. faecium*, an opportunistic pathogen responsible for nosocomial infections in intensive care units, and defining the impact of various drugs used in hospitalized patients on the bacterium's physiology, genome expression and pathogenicity.

### Global assessment of the unit

Overall, GeRMO's research program aims at understanding bacterial evolution and adaptation, with a focus on how a commensal becomes a pathogen - clearly a medically important topic. The unit has obtained a very good national reputation. It has recruited a young, dynamic, outstanding investigator, who will provide GeRMO with new technical and scientific expertise in genomics and post-genomics. Therefore, complementary expertises will bring to the unit more visibility to attract research fellows.

The unit has staff with scientific and technical expertise in their respective fields of research. It is housed in fully upgraded premises, has enough space, given the number of researchers, and has access to appropriate supporting facilities.

Collaborative projects are ongoing with research groups from the USA, Italy, Germany and the Netherlands. Overall, GeRMO is a very good research unit.

### Strengths and opportunities in context

Many unit members have duties at the university hospital medical laboratory, including activities for the National Reference Centre for Antibiotic Resistance (supported by GeRMO). These unit members have established a large collection of clinical isolates of *Streptococcus pyogenes* (the STAB collection) and *Enterococcus* species. These biological resources will clearly be beneficial for future research.

GeRMO's thematic is in line with the current public health priorities, particularly with the emergence of opportunistic, multidrug/pandrug-resistant pathogens.

The international reputation of the newly recruited investigator may help the unit to initiate and develop collaborations and attract post-docs from abroad.

Collaborative projects are ongoing with research groups from the USA, Italy, Germany and The Netherlands.

### Weaknesses and threats in context

The unit's ongoing research projects are not sufficiently focused: there are too many projects with regard to the current workforce.

Three of the four senior researchers are over the age of 55, and one is due to retire this year. Hence, "fresh blood" is necessary if the research unit's goal is to continue to develop.

The research unit is not attractive to post-docs: the director must seek funding opportunities to correct this shortcoming.

### Recommendations

There is a need to focus the research topics, apply for funding and recruit full-time scientists.