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PHAR - Pharmacologie des anti-infectieux

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:

Pharmacology of Antimicrobial Agents

PHAR

under the supervision of
the following institutions
and research bodies:

Université de Poitiers

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

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,¹

Michel Cosnard, president

In the name of the experts committee,²

Margareta Hammarlund Udenaes,
chairwoman 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: Pharmacology of Antimicrobial Agents

Unit acronym: PHAR

Label requested: UMR

Current number: 1070

**Name of Director
(2016-2017):** Mr William COUET

**Name of Project Leader
(2018-2022):** Mr William COUET

Expert committee members

Chair: Ms Margareta HAMMARLUND UDENAES, Uppsala University, Sweden

Experts: Mr Xavier DECLEVES, Université Paris-Descartes (representative of the CSS INSERM)

Ms Peggy GANDIA, Université Paul Sabatier, Toulouse

Mr Cédric JACQUELINE, Université de Nantes (representative of supporting personnel)

Mr Michel TOD, Université Lyon 1

Scientific delegate representing the HCERES:

Mr Jean Edouard GAIRIN

Representatives of supervising institutions and bodies:

Mr Serge HUBERSON, Université de Poitiers

Ms Marie-Jo LEROY-ZAMIA, INSERM

Mr Gérard MAUCO, CHU de Poitiers

Head of Doctoral School:

Mr Frédéric BECQ, Doctoral School n° 524, « Bio-santé »

1 • Introduction

History and geographical location of the unit

UMR-1070 « Pharmacology of Antimicrobial Agents » has been recognized by the University of Poitiers and INSERM from January 1st 2012 for a 6-year period. The thematic of the current unit addresses the major clinical challenge of Multi-Drug Resistant (MDR) bacteria using innovative approaches based on PK/PD modelling. It is located on the University Campus, within the Pôle Biologie Santé, close to the Faculty of Medicine and Pharmacy and of the University Hospital (CHU).

Management team

The unit is managed by Mr William COUET, director with Mr Olivier MIMOZ, deputy director.

HCERES nomenclature

SVE5: Physiologie, Physiopathologie, Cardiologie, Pharmacologie, Endocrinologie, Cancer, Technologies Médicales (main field).

Scientific domains

The main research themes of UMR-1070 are: (a) exploration of antibiotics distribution using microdialysis; (b) aerosol delivery of antimicrobial agents; (c) semi-mechanistic pharmacokinetic-pharmacodynamic modeling of antimicrobial agents; and (d) antiseptic agents for prevention of infection. Colistin represents the emblematic antibiotic for which UMR-1070 has a transversal experience based on the first three themes (a, b, c). The last two themes (c and d) are emerging scientific areas. To avoid projects and resource dispersion, the unit took the decisions to focus on pulmonary infections.

Unit workforce

Unit workforce	Number on 30/06/2016	Number on 01/01/2018
N1: Permanent professors and similar positions	11	12
N2: Permanent researchers from Institutions and similar positions	0	0
N3: Other permanent staff (technicians and administrative personnel)	6	5
N4: Other researchers (Postdoctoral students, visitors, etc.)	0	
N5: Emeritus	0	
N6: Other contractual staff (technicians and administrative personnel)	1	
N7: PhD students	7	
TOTAL N1 to N7	25	
Qualified research supervisors (HDR) or similar positions	8	

Unit record	From 01/01/2011 to 30/06/2016
PhD theses defended	4
Postdoctoral scientists having spent at least 12 months in the unit	0
Number of Research Supervisor Qualifications (HDR) obtained during the period	2

2 • Assessment of the unit

Global assessment of the unit

The unit “Pharmacology of Antimicrobial Agents” is unique world-wide with its multidisciplinary focus on the optimization of antibiotic treatment, built around addressing pharmacokinetic-pharmacodynamic (PK/PD) aspects of antibiotics both pre-clinically as well as clinically, along with biopharmaceutical aspects of dosage forms, in order to specifically address antibiotic resistance and the use of antibiotic drugs in general. This uniqueness is based on addressing the issues from an experimental perspective, refining the findings with PK/PD modelling. Microdialysis has been included as an important technique in the experimental strategies, where tissues of interest may be sampled for the active part of the drug *in vivo* in both animals and humans.

These conditions facilitate translation of *in vitro* and preclinical results to the clinic and, as importantly, the opposite, as clinical problems are addressed in basic research and studied pre-clinically. The expertise is also used to support the clinical use of difficult antibiotics like colistin, where the unit performs chemical analysis of plasma samples and provides advice for dosing regimen adjustments for patients throughout France.

The unit is, based on its skills, playing a pivotal role in several international scientific consortia (AIDA, Co-Action, Combat-Care, iABC) and collaborates with drug companies. It has a high scientific publication rate. Fifteen articles were published in *Antimicrobial Agents and Chemotherapy* as first and/or last authors, which is a high quality journal in the field (IF 4.4). Among these, there a series of articles are being published, addressing the biopharmaceutical classification of pulmonary delivery of antibiotics, which is a sign of the importance of the work on the international scene. The unit has filed two patents addressing important future use of pulmonary administration.

In conclusion, the unit is focused and multidisciplinary, showing their unique strength. Since it started, the unit has grown and developed the research field in a very positive way by employing persons with complementary specialties. The work is impressive as it covers translational aspects of antibiotics from *in vitro* models to the clinic through PK/PD modelling. It has a remarkable societal impact by contributing to optimization of colistin dosing. The unit’s research and environment is considered to be excellent. On a European level, the unit plays a major role by means of its invaluable knowledge and skills on antibiotic PK/PD and clinical use antibiotics which contribute to addressing the field of antibiotic resistance.