

REPORT ON THE RESEARCH UNIT:
Integrated Biology of the Red Cell (BIGR)

UNDER THE SUPERVISION OF THE
FOLLOWING INSTITUTIONS AND
RESEARCH BODIES:

Université Paris Diderot

Institut national de la santé et de la recherche
médicale - Inserm

Université des Antilles

Université de la Réunion

EVALUATION CAMPAIGN 2017-2018
GROUP D



In the name of Hcéres¹:

Michel Cosnard, President

In the name of the expert committee²:

Thomas Wieder, Chairman of the
committee

Under the decree No.2014-1365 dated 14 November 2014,

¹ The president of Hcéres "countersigns the evaluation reports set up by the expert 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).

This report is the sole result of the unit's 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 PRESENTATION

Unit name:	Integrated Biology of the Red Cell
Unit acronym:	BIGR
Requested label:	UMR
Application type:	Renewal
Current number:	UMR_S1134
Head of the unit (2017-2018):	Mr Yves COLIN ARONOVICZ
Project leader (2019-2023):	Mr Yves COLIN ARONOVICZ
Number of teams:	4

COMMITTEE MEMBERS

Chair: Mr Thomas WIEDER, University Tübingen, Germany

Experts: Ms Lucia DE FRANCESCHI, University Verona, Italy
Ms Françoise GUERLESQUIN, Université de Marseille (representative of CNU)
Mr Kai MATUSCHEWSKI, Humboldt University, Berlin, Germany
Mr Antonio PEIXOTO, CNRS de Toulouse (supporting personnel)
Mr Éric SOLER, CNRS de Montpellier (representative of Inserm CSS)
Mr Bruno ROBERT, CEA de Saclay

HCERES scientific officer:

Mr Jean-Paul LALLÈS

Representatives of supervising institutions and bodies:

Ms Sylvie DELAUNE, Institut National de la transfusion Sanguine
Ms Sylvie ROUSSET, University Paris Diderot

INTRODUCTION

HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

The unit "Integrated Biology of the Red Cell (BGR)" was created as UMR_S665 "Red cell membrane proteins and non-erythroid homologues" in 2005 with team 1 and team 2, and then as UMR_S1134 "Integrated biology of the red cell" in 2014. In January 2012, members of UMR_S763 were integrated into team 1. In 2014, team 3 "Pathogenesis of severe malaria" joined the unit to conduct a new project on the adhesion of *P. falciparum*-infected cells to endothelial cells. In January 2016, team 4 "Tissular Biology of the Red Cell" joined the unit to investigate the rheological and morphological properties of pathological red cells, including in malaria. Since then, the unit is organized in 4 teams. The central laboratories of the unit are part of the French National Institute of Blood Transfusion (INTS) and are located at INTS, 6 rue Alexandre Cabanel, Paris. In addition, the unit is dispatched in two other sites overseas: the University of the Antilles in Guadeloupe (Caribbean Sea) and the University of St. Denis-La Reunion (Indian Ocean). Therefore, the unit counts five supervising institutions (3 universities, INTS and Inserm).

MANAGEMENT TEAM

Director: Mr Yves Colin Aronovicz. Future deputy head: Ms Caroline Le van Kim; future director: Mr Yves Colin Aronovicz.

HCERES NOMENCLATURE

SVE2-1; SVE2-3; SVE3-3.

SCIENTIFIC DOMAIN

The main objective of the unit is to disclose the physiological and pathophysiological features of mature human red blood cells. Specifically, the unit analyses the properties of red blood cells on the level of the main macromolecules, i. e. the red blood cell membrane proteins (transporters, receptors, adhesion molecules etc.). The structure and function of these proteins are deciphered by combining biochemical real-life methods and in-silico prediction methods. The other three main areas of research relate to red blood cell pathologies, e.g. sickle cell disease, polycythemia vera etc., infectious diseases, mainly severe malaria, and red blood cell filtration in the spleen. The 4 teams of the unit concentrate their scientific efforts on one single cell type: the red blood cell. This focus on red blood cells allows to bring together biochemically and molecularly oriented basic research groups (team 1 and 2) and clinically oriented research groups with a clear physiological or pathological background (team 3 and 4).

UNIT WORKFORCE

Unit workforce	Number 30/06/2017	Number 01/01/2019
Permanent staff		
Full professors and similar positions	8	7
Assistant professors and similar positions	6	9
Full time research directors (Directeurs de recherche) and similar positions	3	4
Full time research associates (Chargés de recherche) and similar positions	5	4

Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.")	4	10
High school teachers	0	0
Supporting personnel (ITAs, BIATSSs and others, notably of EPICs)	12	18
TOTAL permanent staff	39	50
Non-permanent staff		
Non-permanent professors and associate professors, including emeritus	2	
Non-permanent full time scientists, including emeritus, post-docs	12	
Non-permanent supporting personnel	3	
PhD Students	23	
TOTAL non-permanent staff	40	
TOTAL unit		
	78	

GLOBAL ASSESSMENT OF THE UNIT

The BIGR unit consists of four teams. It is a unique laboratory working in field of red blood cells that has developed and implemented an impressive technological facility for RBC analysis (the RBC clinic). It is important to emphasize that this line-up of teams with complementary expertise in erythrocyte biology and pathology is an asset that is missing in most countries and, hence, should be considered of utmost importance. The four teams are involved individually as partners in the GR-Ex labex. The unit has addressed the previous criticism of lack of *in vivo* models and set up cooperation with partners outside the unit to enable access to mouse facilities.

The unit gathers principal investigators and researchers with high national and international reputation who are recognized as leading experts in their research field. The proven track record of publications has very high inherent quality and impact, and fully meets the expectations of the visiting committee. More precisely, this track record is widely acknowledged inside the red cell society of research, and many prominent publications in the leading journal *Blood* testify to the very high standards of the unit. The unit has successfully applied for both European and national grants, and is an important part of European networks. As some of the senior scientists including the director will retire in the next few years, the unit is undergoing a profound and exciting transition. Therefore, further development of the new scientific leaders is crucial for the scientific future of the unit.

Although the team leaders had made tremendous efforts to gain expertise in *in vivo* models by cooperating with research groups outside of the unit, concern remains about the possibility to independently conduct *in vivo* experiments in core facilities of the unit or of partner institutions.

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