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# Cancer et génome : bioinformatique, biostatistiques et épidémiologie d'un système complexe

Rapport Hcéres

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## REPORT ON THE RESEARCH UNIT:

Cancer and Genome: Bioinformatics,  
Biostatistics and Epidemiology of Complex  
Systems (U900-CBIO)

## UNDER THE SUPERVISION OF THE FOLLOWING INSTITUTIONS AND RESEARCH BODIES:

Institut Curie

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

Mines ParisTech

**ÉVALUATION CAMPAIGN 2017-2018**  
GROUP D



In the name of Hcéres<sup>1</sup>:

Michel Cosnard, President

In the name of the expert committee<sup>2</sup>:

Anne Siegel, Chairwoman of the committee

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

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

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

<b>Unit name:</b>	Cancer and Genome: Bioinformatics, Biostatistics and Epidemiology of Complex Systems
<b>Unit acronym:</b>	U900-CBIO
<b>Requested label:</b>	Inserm unit
<b>Application type:</b>	Renewal
<b>Current number:</b>	U900
<b>Head of the unit (2017-2018):</b>	Mr Emmanuel BARILLOT et Mr Jean-Philippe VERT
<b>Project leader (2019-2023):</b>	Mr Emmanuel BARILLOT et Mr Jean-Philippe VERT
<b>Number of teams:</b>	4

## COMMITTEE MEMBERS

<b>Chair:</b>	Ms Anne SIEGEL, CNRS-IRISA Rennes
<b>Experts:</b>	Mr Christophe AMBROISE, Institut de Biologie Génétique et Bio-informatique, Évry Mr Franck DELAUNAY, Institut de Biologie Valrose, Université Nice Sophia Antipolis Mr Benjamin GILLET, IGFL, ENS Lyon (supporting personnel) Mr Krzysztof JAGLA, Université de Clermont (representative of Inserm CSS) Ms Catherine LEGRAND, Université Catholique de Louvain, Belgique Ms Marjanka SCHMIDT, The Netherlands Cancer Institute, Amsterdam
<b>Hcéres scientific officer:</b>	Mr Pierre COUBLE

**Representatives of supervising institutions and bodies:**

Ms Geneviève ALMOUZI, Institut Curie

Ms Camille CHAUDONNERET, Inserm

Ms Catherine NGUYEN, Inserm

Mr Yannick VIMONT, École des Mines

## INTRODUCTION

### HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

U900-CBIO was created in 2008, as an extension of a bioinformatics platform that has been founded in 2003 by Institut Curie (IC). The structure is made of two components: an Institut Curie/Inserm unit (U900) and a Mines ParisTech Center (CBIO). The first component (Inserm U900) comprises three research teams and a bioinformatics platform (core facility). The second component (CBIO) is composed of a single team. A consortium agreement was negotiated between IC, Inserm and Mines ParisTech to clarify the partnership. The two components are independent as far as administration and finances are concerned. During daily activities, the CBIO component is considered as an equivalent team to the others.

The partnership is located on four sites: Institut Curie Saint-Cloud site hosts one team, Institut Curie Paris site hosts two teams, the platform (core facility) and half of the CBIO team. The other half of the CBIO team is hosted on Mines Paris Tech site. The last team is hosted in a building rented by Institut Curie, within walking distance of the two latter sites.

### MANAGEMENT TEAM

The partnership is composed of two components. The U900 part involves a partnership between IC and Inserm and is led by Mr Emmanuel BARILLOT. The CBIO component involves Mines ParisTech and is headed by Mr Jean-Philippe VERT.

### Hcéres NOMENCLATURE

SVE6\_2; SVE2\_2; SVE6\_1.

### SCIENTIFIC DOMAIN

The main scientific domains of the unit are computational and systems biology applied to molecular and cellular cancer research. To achieve the goal of analyzing large-scale cancer datasets, the unit develops methodological researches in:

- epidemiology (team 1, led by N. ANDRIEU),
- computational systems biology of cancer (team 2, led by E. BARILLOT),
- machine learning and high dimensional data analysis (team 3, led by J.-P. VERT),
- biostatistics (team 4, led by A. LATOUCHE since 2016).

In addition, the unit hosts a bioinformatics platform (gathering one third of the unit staff). The activities of the platform are mainly focused on the analysis and treatment of data produced by other units of IC. A short part of its activity is related to supporting research activities of the unit. The activities of the platform were not part of the evaluation.

### UNIT WORKFORCE

Unit workforce	Number 30/06/2017	Number 01/01/2019
<b>Permanent staff</b>		
Full professors and similar positions	5	4
Assistant professors and similar positions	0	0

Full time research directors (Directeurs de recherche) and similar positions	2	3
Full time research associates (Chargés de recherche) and similar positions	3	3
Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.")	4	3
High school teachers	0	0
Supporting personnel (ITAs, BIATSSs and others, notably of EPICs)	24	23
<b>TOTAL permanent staff</b>	<b>38</b>	<b>36</b>
<b>Non-permanent staff</b>		
Non-permanent professors and associate professors, including emeritus	0	
Non-permanent full time scientists, including emeritus, post-docs	9	
Non-permanent supporting personnel	6	
PhD Students	14	
<b>TOTAL non-permanent staff</b>	<b>29</b>	
<b>TOTAL unit</b>		
	<b>67</b>	

## GLOBAL ASSESSMENT OF THE UNIT

The unit has had outstanding scientific results, widely disseminated via publications, presentations, and release of free software and packages implementing the achievements made. A noticeable feature of the unit is its capability to cover a complete scientific spectrum, from very theoretical results in computer sciences and mathematics to applied results in data analysis and molecular biology. The unit had an outstanding number of grants in cancer computational biology at national and European level, involving a wide network of international collaborators. In terms of scientific policy, the unit has recruited a new very promising PI in clinical biostatistics to balance the leave of a former PI in this domain. Locally, the unit is excellently integrated within the research ecosystem.

The committee noticed that interactions between the teams' unit are not favored by the four different locations of the unit. Some of the teams are understaffed and could benefit for more stable research positions. Both the number of PhDs and the outputs of the PhD students are very heterogeneous within the teams and could be globally increased. The bioinformatics platform represents an important part of the unit staff and activity and has a major role in terms of dissemination. The unit would strongly benefit of making explicit and clear the different activities of the platform, from internal support to the unit's research teams (software development, data analysis) to external support to IC teams and national programs (bioanalysis).

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2 rue Albert Einstein  
75013 Paris, France  
T. 33 (0)1 55 55 60 10

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