

FINAL RESUME ON THE RESEARCH UNIT:
Health Engineering Biology
Saint-Etienne (SAINBIOSE)

Under the supervision of the following
institutions and research bodies:

Université Jean Monnet Saint-Étienne
- UJM

Mines St-Etienne

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

Établissement Français du Sang - EFS

EVALUATION CAMPAIGN 2019-2020
GROUP A



In the name of Hcéres¹:

Nelly Dupin, Acting
President

In the name of the experts committee²:

Pierre Boutouyrie, 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 experts committees and signed by their chairman." (Article 8, paragraph 5);

² The evaluation reports "are signed by the chairman of the experts committee". (Article 11, paragraph 2).

Tables in this document were filled with data submitted by the supervising body on behalf the unit.

UNIT PRESENTATION

Unit name:	Health Engineering Biology Saint-Etienne
Unit acronym:	SAINBIOSE
Current label and N°:	UMR 1059
ID RNSR:	201622149K
Application type:	Restructuration
Head of the unit (2019-2020):	Ms Laurence Vico
Project leader (2021-2025):	Ms Laurence Vico
Number of teams and/or themes:	2

EXPERTS COMMITTEE MEMBERS

Chair:	M. Pierre BOUTOUYRIE, Université Paris Descartes
Experts:	Ms Ariane BERDAL, Université Paris Diderot (representative of Inserm CSS) Ms Chantal CHENU, Université de Londres, UK Mr Tien TUAN DAO, CNRS Compiègne (supporting personnel) Ms Françoise DEBIAIS, université de Poitiers Mr Mathieu MOLIMARD, université de Bordeaux (representative of CNU) Mr Alberto REDAELLI, Politechnico di Milano, Italy

HCÉRES REPRESENTATIVE

Mr Jean Edouard GAIRIN

REPRESENTATIVES OF SUPERVISING BODIES

Mr Raymond BAZIN, INSERM
Mr Fabrice COGNASSE, Etablissement Français du Sang
Mr David DELAFOSSE, Ecole des Mines de Saint-Etienne
Mr Stéphane RIOU, Université Jean Monnet Saint-Etienne

INTRODUCTION

HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

The SAINBIOSE Unit (SANTé Ingénierie BIOlogie Saint-Etienne) was issued from the Institut Fédératif de Recherche (IFR) en Sciences et Ingénierie de la Santé, called IFRESIS (2007 – 2010) and is member of the Université Jean Monnet (UJM), the École des Mines de Saint-Etienne (EMSE) and the Centre Hospitalier Universitaire (CHU) de Saint-Etienne). IFRESIS is granted by INSERM and comprises 15 research laboratories. Merging started in 2011 (creation of LINA (Interdisciplinary Laboratory for the Study of Aerosolized Nanoparticles) from 2 founding teams.

SAINBIOSE is embedded within the teaching hospital of Saint-Etienne (CHU) and the Centre d'Investigation Clinique (CIC, Epidémiologie Clinique - Clinical Trials, CIE3, INSERM).

SAINBIOSE is located on the Campus Santé Innovations (Health Innovation Campus) in Saint-Étienne. Three new buildings have been raised since 2015 to house the UJM Medical Faculty (UFR Médecine), the EMSE's Engineering and Health Centre (CIS) and the Regional Institute of Medicine and Sports Engineering (IRMIS, UJM).

Management team

The director of SAINBIOSE is Laurence Vico, and the deputy head is Stéphane AVRIL.

HCÉRES NOMENCLATURE

SVE5

THEMATICS

The research topics of the Unit are: understanding regulatory processes under biostresses, developing dynamic modelization and innovative technologies, and propose precision medicine, in the context of osteoarticular and cardiovascular pathologies.

UNIT WORKFORCE

Health Engineering Biology Saint-Etienne		
Active staff	Number 06/30/2019	Number 01/01/2021
Full professors and similar positions	22	30
Assistant professors and similar positions	13	13
Full time research directors (Directeurs de recherche) and similar positions	1	1
Full time research associates (Chargés de recherche) and similar positions	2	2
Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.")	0	2
High school teachers	0	0
Supporting personnel (ITAs, BIATSSs and others, notably of EPICs)	27	37
Permanent staff	65	85
Non-permanent professors and associate professors, including emeritus	0	
Non-permanent full time scientists, including emeritus, post-docs (except PhD students)	7	

PhD Students	37	
Non-permanent supporting personnel	0	
Non-permanent staff	44	
Total	109	85

GLOBAL ASSESSMENT OF THE UNIT

The activities of the Unit can be grouped in two main areas: - i) the influence of mechanical biostresses on bone and joint, and – ii) the effect of biostresses on the vasculature together with thromboembolic disorders and their pharmacological treatments, according to their two constituent teams “Laboratory of Osteo-articular Tissue Biology”(LBTO) and “Vascular Dysfunction and Hemostasis” (DVH) respectively.

The main topic of LBTO is to better understand the origin of degenerative bone/cartilage/joint diseases on one side, and cardiovascular and thrombotic diseases on the other side. The link can be made through biostresses, especially mechanical and inflammation. Indeed, both the osteo-articular system and the cardiovascular system are exposed to mechanical forces which are strong determinants of remodeling. Space travels are one example in which reduction of mechanical stress (microgravity) induces loss of bone, muscle and cardiovascular remodeling. Reduction of physical activity is also relevant for chronic inflammatory diseases and chronic cardiovascular disease. Further, mechanical stress is a leading cause of organ failure such as aortic aneurysm and response of bone to aggression. The main topic of the team DVH is to better understand and improve quality of care for thromboembolic diseases, which are a major cause of morbidity and the main cause of iatrogenic complications. Relations between vascular diseases and thrombosis are many and strong, little has been done right now to couple those two themes. Emergence of new modalities of treatment (new oral anticoagulants), and new intravenous drugs has led to a change in paradigm. DVH has produced a large number of high-quality clinical trials helping to improve medical care to patients receiving anticoagulant treatments.

The Unit activities in the past term was excellent. The overall scientific production is excellent, with close to 500 articles, over one third in high impact journals (*NEJM*, *JAMA*, *BMJ*, ...), and half of the scientific production as first, second, last or corresponding author. Participation in large international projects is very good, however, it could be better, compared to international standards. Although breakthrough findings cannot be commanded, the Unit could improve the culture of collaboration. In particular, the Unit should participate more to Research networks and consortium at the international, academic level for conceptual projects, not only for clinical trials. The strategic plan is very good, oriented toward improving scientific performance. Some ambitious objectives might be difficult to attain, for instance 20% of inter-team papers.

The Unit has excellent interactions with the non-academic world concerning both the drug development and other industrial counterparts. However, communication with the public is insufficient and insufficiently developed in the perspectives. The Unit is well integrated into the university and other teaching structures local environment. The level of supervising and transmission of knowledge and the management of PhD students are good. However, the transversal scientific animation for all categories of researchers could be improved. Similarly, there is room for improvement for the attractivity of the foreign PhD students. In the strategic plan, there should be an effort to promote national and international collaborations.

The Unit has a good, well-defined and logical governance structure and associated research activities, which are well distributed along the year. The organization and management of the technical staff have room for improvement for optimizing people knowing each other, sharing of information and expertise, and globally empowering and rewarding the technical staff. In the strategic plan, little is detailed for promoting more blending between teams, both in scientific terms and in social life terms.

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

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