LISBP - Laboratoire d'ingénierie des systèmes biologiques et des procédés

Rapport Hcéres

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

HCERES report on interdisciplinary unit:

Laboratoire d'Ingénierie des Systèmes Biologiques et des Procédés

LISBP

Under the supervision of the following institutions and research bodies:

Institut National des Sciences Appliquées de Toulouse

Institut National de la Recherche Agronomique - INRA

Centre National de la Recherche Scientifique - CNRS

Evaluation Campaign 2014-2015 (Group A)

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

In the name of HCERES,[1]

Didier HOUSSIN, president

In the name of the experts committee,[2]

Tom DESMET, chairman 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 result of the evaluation by the experts committee, the composition of which is specified below.

The assessments contained herein are the expression of an independent and collegial deliberation of the committee.

Unit name:	Laboratoire d'Ingénierie des Systèmes Biologiques et des Procédés
Unit acronym:	LISBP
Label requested:	UMR INSA CNRS INRA
Present no.:	UMR INSA CNRS 5504 - INRA 792
Name of Director (2014-2015):	Mr Nicholas LINDLEY
Name of Project Leader (2016-2020):	Mr Nicholas LINDLEY

Expert committee members

Chair:	Mr Tom DESMET, Center for Industrial Biotechnology and Biocatalysis, Gent, Belgium Mr Andreas SCHMID, Helmholtz Center for Environmental Research, Leipzig, Germany
Experts:	Ms Pascale DARAN-LAPUJADE, Delft University of Technology, The Netherlands (representative of the CSS INRA) Mr Pascal DHULSTER, Polytech'Lille (representative of the CNU) Ms Francine FAYOLLE, GEPEA Nantes Mr Jean-Luc GALZI, University of Strasbourg, (representative of the CoNRS) Ms Marie-Thérèse GUIDICI-ORTICONI, Aix-Marseille University Mr Robbert KLEEREBEZEM, Delft University of Technology, The Netherlands Ms Laurence MUHR, LRPG, University of Lorraine

Scientific delegate representing the HCERES:

Ms Catherine SCHUSTER

Representatives of the unit's supervising institutions and bodies:

Ms Catherine AZZARO (representative of the Doctoral School N°468)

Mr Eric JUSTES (representative of the Doctoral School N°458)

Ms Emmanuelle MAGUIN, INRA

Ms Isabelle MAILLET, INRA

Ms Marie-Yvonne PERRIN, CNRS

Mr Bertrand RAQUET, INSA

1 • Introduction

History and geographical location of the unit

The **Laboratoire d'Ingénierie des Systèmes Biologiques et des Procédés** (LISBP) is located at the INSA site in Toulouse and has existed in its current state since 2007, following the fusion of two independent laboratories dedicated to Biotechnology-Bioprocesses and Environmental Process Engineering. The LISBP is composed of 11 teams and 5 platforms. The scientific objectives are to offer a basic research input for an integrated approach to modern industrial biotechnology with wide applications in energy (biofuels), synthons, biomaterials, pharmaceuticals, food and feed as well as water resources. The platforms cover the areas Transcriptome - Biopuces (GeT); Engineering and Screening for Original Enzyme (ICEO); Métabolomics and Fluxomics (MetaToul) and the technical platform for quantitative and functional ecology.

Management team

Head: Mr Nicholas LINDLEY

Deputy head: Mr Pascal GUIRAUD

Deputy head: Mr Pierre MONSAN

HCERES nomenclature

SVE2_LS9 Biotechnologies, sciences environnementales, biologie synthétique, agronomie

ST5 Sciences pour l'ingénieur

Unit workforce

Unit workforce	Number as at 30/06/2014	Number as at 01/01/2016
N1: Permanent professors and similar positions	43 (19.85)	44 (21.35)
N2: Permanent researchers from Institutions and similar positions	30 (28.7)	33 (31.7)
N3: Other permanent staff (without research duties)	64 (54.15)	62 (52.15)
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)	6 (2)	5 (1.5)
N5: Other researchers (Emeritus Research Director, Postdoctoral students, visitors, etc.)	89 (76.2)	88 (75)
N6: Other contractual staff (without research duties)	6 (5.5)	9 (8.5)
TOTAL N1 to N6	**238 (186,4)**	**241 (190,2)**

Unit workforce	Number as at 30/06/2014	Number as at 01/01/2016
Doctoral students	71	
Theses defended	107	
Postdoctoral students having spent at least 12 months in the unit	33	
Number of Research Supervisor Qualifications (HDR) taken	9	
Qualified research supervisors (with an HDR) or similar positions	46	49

2 • Overall assessment of the interdisciplinary unit

Global assessment of the unit

LISBP was created based on the vision of combining applied microbiology and biochemical engineering with process engineering, as to enable the integrated development of biotechnological applications. LISBP is bridging cutting edge research in synthetic biology with applications in process engineering. The philosophy is to bring engineering concepts into biology. To that end, two different laboratories were merged into one, which now houses a broad range of complementary expertise. Such a multidisciplinary organization is unique in France and has made LISBP one of the leading centers for industrial biotechnology in the country. Their activities are supported by the joint technology platform 'MetaToul', while interactions with the industry are promoted by the demonstrator project 'Toulouse White Biotechnology'.' Overall, this set-up is very attractive and forms an excellent basis for cutting-edge research. Both units together developed into one of the leading centers for science, research and application on industrial biotechnology in Europe.

However, some organizational challenges still need to be resolved with respect to the overlapping competencies and diverging sizes of the teams. This situation has been exaggerated by the recent growth of LISBP, due to its remarkable success in attracting project funding. The key challenge still is to integrate engineering projects and (synthetic) biology of various kinds in a scientific way. Nevertheless, a clear structure has been put in place to handle these issues and to ensure a smooth transition into a unified laboratory with a common research goal. In that way, LISBP should be able to position itself at the forefront of science, not only in France but also worldwide.

Strengths and opportunities in relation to the context

LISBP houses a broad range of complementary expertise in (synthetic) biology and process engineering, which is rather unique in France.

All required tools are available, also through the joint technology platform MetaToul.

The connections with industry are facilitated by the demonstrator project Toulouse White Biotechnology (TWB).

The laboratory has been very successful in attracting funding from public and private sources.

The scientific output of the different teams is excellent and is even still increasing.

Weaknesses and threats related to the context

Multidisciplinary collaborations (engineering integrated in biology) have not been fully established, which carries a risk of dispersion.

The international visibility of LISBP as a center for industrial biotechnology is rather low.

Industrial biology and synthetic biology are very competitive domains at the international stage.

In some teams, technical support lacks critical mass and renewal of staff is uncertain.

The planned change in management causes uncertainty over future directions in a time of transition.

Recommendations

Organize the teams to maximize complementarity and coherence in their structure with the objective of scientific excellence.

Enable multidisciplinary collaborations by focusing on specific targets and rewarding ambitious projects.

Increase international visibility by applying for European projects and by attracting foreign scientists.