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LPCV - Laboratoire de physiologie cellulaire et végétale

Rapport Hcéres

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HCERES

High Council for the Evaluation of Research
and Higher Education

Research units

HCERES report on research unit:

Laboratory Cell & Plant Physiology

LPCV

Under the supervision of
the following institutions
and research bodies:

Université Joseph Fourier - Grenoble - UJF

Commissariat à l'énergie atomique et aux énergies
alternatives - CEA

Centre National de la Recherche Scientifique - CNRS

Institut National de la Recherche Agronomique - INRA

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

Jean-David ROCHAIX, chairman of the
committee

Under the decree N.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:	Laboratory Cell & Plant Physiology
Unit acronym:	LPCV
Label requested:	Unité Mixte de Recherche UGA/CNRS/CEA/INRA
Present no.:	UMR 5168 UGA/CNRS/CEA USC 1359 INRA
Name of Director (2014-2015):	Mr Norbert ROLLAND
Name of Project Leader (2016-2020):	Mr Norbert ROLLAND

Expert committee members

Chair:	Mr Jean-David ROCHAIX, Université de Genève, Suisse
Experts:	Mr Andreas BAUSCH, Technical University of Munich, Germany
	Ms Andrea HEMMERLIN, CNRS, Strasbourg (representative of the CoNRS)
	Mr Jean-Pierre JACQUOT, Université de Lorraine (representative of the CNU)
	Ms Anne KRAPP, INRA, Versailles, (representative of the INRA)
	Mr Uwe MAIER, University of Marburg, Germany
	Ms Franziska TURCK, Max Planck Institute for Plant Breeding Research-Köln, Germany
	Ms Nathalie VERBRUGGEN, Université Libre de Bruxelles, Belgique

Scientific delegate representing the HCERES:

Mr Steven G. BALL

Representatives of the unit's supervising institutions and bodies:

Ms Christelle BRETON (Doctoral School UJF - Chimie et Sciences du Vivant ED n°218)

Mr Johann COLLOT (Doctoral School UJF - École Doctorale de Physique de Grenoble ED n°47)

Ms Alix DE LA COSTE, DSV-CEA

Mr Franck FIESCHI, Université Grenoble Alpes

Mr Thierry GAUDE, CNRS, INSB

1 • Introduction

History and geographical location of the unit

The LPCV (*Laboratoire de Physiologie Cellulaire et Végétale*) UMR is a joint laboratory (Unité Mixte de Recherche, UMR 5168) of University Grenoble Alpes, the CNRS (INSB) and the CEA. It is also tied by contract to the INRA with the USC (Unité sous contrat) status. The INRA contemplates associating itself to the three other funding bodies for the next term in the form of an UMR. The UMR is located on the West CEA Campus of Grenoble and is a member of the iRTSV (Institute of life sciences and technologies) a “Research Federation” (FR) specialized in proteomic analysis and uniting 4 distinct research units associated with the CEA, the INSERM, the INRA, the CNRS and the Grenoble Alpes University.

The joint unit currently contains 6 teaching staff members (professors and assistant professors) and 27 CNRS/INRA/CEA researchers (directeurs de recherche and chargés de recherche, cadres confirmés et supérieurs du CEA). The technical staff is composed of 19 members (engineers and technicians from the CNRS, INRA and CEA). There are currently (as of June 2014) 20 PhD students and 20 postdocs. The current yearly budget of the unit consists of 183 kEuros (not including salaries) from the research bodies (CNRS/CEA/INRA/University) topped by an average of 2000 kEuros from research contracts (including salaries of temporary staff (PhD students, postdocs, technicians)).

Management team

Since 2011, the LPCV has been directed by Dr Norbert ROLLAND/Dr Laurent BLANCHOIN respectively as director/deputy director with the assistance of permanent administrative staff composed of one CEA Technician and one CNRS Technician and with the help of a temporary CNRS staff. The management team is assisted by the laboratory council, the scientific council and the management council. At the end of the preceding period LPCV encompassed 8 scientific research teams with a high level of scientific autonomy, each of which was managed by a group leader. For the next period, the same management team is envisioned while the 8 teams will be restructured into 7 teams headed by one or eventually two distinct scientists.

HCERES nomenclature

Sous domaine AEE (Agronomie Écologie Environnement)

Sous-domaine secondaire SVE1_LS2

Sous-domaine secondaire SVE2 LS9

Unit workforce

Unit workforce	Number as at 30/06/2014	Number as at 01/01/2016
N1: Permanent professors and similar positions	6	6
N2: Permanent researchers from Institutions and similar positions	26	27
N3: Other permanent staff (without research duties)	13	14
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers (Emeritus Research Director, Postdoctoral students, visitors, etc.)	10	7
N6: Other contractual staff (without research duties)	9	4
TOTAL N1 to N6	64	58

Unit workforce	Number as at 30/06/2014	Number as at 01/01/2016
Doctoral students	19	
Theses defended	25	
Postdoctoral students having spent at least 12 months in the unit	5	
Number of Research Supervisor Qualifications (HDR) taken	5	
Qualified research supervisors (with an HDR) or similar positions	23	21

2 • Overall assessment of the unit

Global assessment of the unit

LPCV is a research unit devoted to research on plant development, chloroplast biogenesis, metabolism and photosynthesis, and cytoskeleton assembly. The overall scientific quality of LPCV is outstanding both in qualitative and quantitative terms. Most of the 7 teams of this unit have published in journals with high impact factors and several important breakthroughs have been reported in galactolipid metabolism, thylakoid membrane channels, transcription factors and actin filaments. Moreover, widely accessed on-line databases contribute to the appeal of the unit. The different teams have been particularly successful in external collaborations, which have resulted in cutting-edge science. Beside its heavy involvement in basic research, LPCV has also successfully engaged in more applied projects resulting in many patents. In addition, this unit has made efforts of communication to the media and public, especially with regard to GMO (Genetically Modified Organism) technology. The overall management and organisation of the unit has been outstanding over the evaluation period. LPCV is heavily involved in teaching and takes care of a large part of teaching plant science at the UJF (University Joseph Fourier now UGA (University Grenoble-Alpes)). Through its scientific excellence LPCV has gained international recognition and attracted foreign students and researchers.

Strengths and opportunities in relation to the context

LPCV has made important contributions in several areas of plant science during the period 2009-2014 including the regulation and dynamics of the photosynthetic machinery, galactolipid metabolism, subcellular proteomics, cell and tissue morphogenesis and transcription factor structure/function evolution. Teams of the LPCV have made several break-through discoveries resulting in publications in high ranking journals including:

Identification of Galvestine 1 as a specific inhibitor of monogalactosyl-diacylglycerol synthases through a large scale screen which opens new powerful tools for studying galactolipid metabolism in plants and algae as well as of chemicals which trigger accumulation of triacylglycerol in algae.

Identification of a thylakoid two-pore K⁺ channel involved in the control of light energy utilization.

Establishment of a subplastid proteomics data base of more than 1000 proteins for Arabidopsis which provides a global view of the subcellular compartmentalization of organellar biosynthetic pathways.

Demonstration that the LFY transcription factor involved in the formation of novel stem cell centers during flower development evolved through the transient presence of both ancient and new structural features.

Establishment of a novel approach for the local and temporal control of the nucleation and growth of actin filaments to determine cytoskeletal structure formation processes and their functional consequences.

During the last granting period LPCV has attracted two new prominent investigators in the areas of bioenergetics of photosynthesis, chloroplast biogenesis and retrograde signaling. Both of these investigators have made important contributions to their field in the past and will significantly strengthen and widen the expertise of LPCV in plant biology. Furthermore, a young principal investigator has recently selected the LPCV to establish an

ATIP-avenir team. Altogether there has been a significant increase in international researchers during the last granting period, which shows that LPCV is scientifically attractive.

LPCV has acquired strong technical expertise for proteomics and more recently in nanotechnology, imaging and surface modification in the context of studies of the cytoskeleton. LPCV has been very active in the context of biotechnology and communication to society by filing several patents and by being heavily involved in the public GMO debate.

Close proximity to the main UJF campus and a strong involvement of university staff in teaching at UJF provides an excellent platform to attract students. LPCV hosts many PhD and other postgraduate students, who strongly contribute to the quality of the research. Numerous opportunities are available and have been seized to explore collaboration and joint funding with teams in similar fields of expertise both at the national and international level. This further enhances the potential for high-impact research through collaboration. There is also a very dynamic regional environment for translational research. The unit is embracing this opportunity with a number of initiatives, which bring together expertise in basic science at the unit with industrial partners. Some of the specific research areas and topics are highly original and competitive at the international level.

Weaknesses and threats related to the context

The research entity is organized as seven independent teams, each one having its own leadership and scientific policy. The scientific strength of all the teams is outstanding to excellent, with a great international visibility. Attention should be paid in keeping the scientific focus and avoiding too much dispersion.

A major limitation for the current and future development and success of the unit is the lab space situation. The current lab building imposes not only limitations to research efforts but also poses a serious security issue due to its deterioration. Although a new building had been already planned and was close to realisation, all efforts have been cancelled. Immediate action is required.

The access of Master- and PhD students and Postdocs to the CEA campus is over-regulated. The regulations limit the effective work conditions seriously - a permanent access to them is required to be competitive in the research. Access is needed also after the official contract is finished, the possibility of immediate prolongation of PostDoc contracts and re-entry into the labs is mandatory.

Recommendations

The LPCV teams and the management team should be congratulated for their outstanding performance during the last granting period and encouraged to continue their work at the same pace. A strategy has to be found to provide an adequate lab environment for the unit, to not only ensure lab safety but also further developments of the unit. It is important that the LPCV management finds ways to fill in the following positions:

An additional administrative position is critically needed for the administration of a unit of 100 persons at the LPCV.

The CRSSA-employed technician at work in the lipidomics facility has been granted the reception of a permanent position by the CNRS. The unit should find ways to implement the conversion of this position in the very near future as this is mandatory to be able to further develop the lab and respond to new challenges and demands, resulting from the high dynamics and productivity of the lab.

The bioinformatics expertise is seriously understaffed and needed within this laboratory. This threatens the outstanding performance of the unit.

Attention should be paid to provide the best possible support to the three team leaders who joined LPCV recently.

The teams of LPCV have been successful in obtaining national grants. They are encouraged given their excellent scientific status to apply for more European grants including ERC. Particular efforts should be made to increase the attractiveness for researches eligible for EMBO, Marie Curie and HFSP fellowships.