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RIBP - Résistance induite et bioprotection des plantes

Rapport Hcéres

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HCERES

High Council for the Evaluation of Research
and Higher Education

Department of Research Evaluation

report on research unit:

Induced Resistance and Plant Bio-protection

RIBP

under the supervision of
the following institutions
and research bodies:

Université de Reims Champagne-Ardenne

Institut National de la Recherche Agronomique - INRA

Evaluation Campaign 2016-2017 (Group C)

HCERES

High Council for the Evaluation of Research
and Higher Education

Department of Research Evaluation

In the name of HCERES,¹

Michel Cosnard, president

In the name of the experts committee,²

Ksenia Krasileva, chairwoman 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 sole result of 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 name: Induced Resistance and Plant Bio-protection

Unit acronym: RIBP

Label requested:

Current number:

**Name of Director
(2016-2017):** Mr Christophe CLÉMENT

**Name of Project Leader
(2018-2022):** Mr Christophe CLÉMENT

Expert committee members

Chair: Ms Ksenia KRASILEVA, Earlham Institute and The Sainsbury Laborator, United Kingdom

Experts: Ms Brigitte MAUCH-MANI, University of Neuchâtel, Switzerland
Ms Linda STAMMITTI-BERT, Université de Bordeaux
Mr Pierre-Louis TEISSEDE, Université de Bordeaux

Scientific delegate representing the HCERES:
Mr Serge DELROT

Representative of supervising institutions and bodies:
Mr Guillaume GELLE, Université de Reims Champagne-Ardenne

Head of Doctoral School:
Ms Sandrine BOUQUILLON, Doctoral school n° 547, "Science, Technology and Health"

1 • Introduction

History and geographical location of the unit

Created in 1996 at the University of Reims Champagne-Ardenne (URCA), this research unit was originally composed of 5 labs focused on sustainable viticulture and the development of new treatments of grapevine diseases.

For the 2012-2017 contract, the research unit included 2 laboratories: the SDRP lab (Plant Stresses, Defences and Reproduction) interested in grapevine defence mechanisms and the way to stimulate its immunity and the LOCA (Lab of Oenology and Applied Chemistry) that investigated the consequences of grey mold and alternative strategies on Champagne quality.

The two labs will separate at the onset of the 2018-2022 contract. Currently, the SDRP lab is proposed to be organized as a single team entitled Induced Resistance and Plant Bioprotection (RIBP).

Management team

For the next contract, the unit will be directed by Mr Christophe CLÉMENT, and Mr AIT BARKA will be deputy director.

HCERES nomenclature

SVE1 Agronomie, Biologie Végétale, Écologie, Environnement, Évolution

SVE2 Biologie Cellulaire, Imagerie, Biologie Moléculaire, Biochimie, Génomique, Biologie Systémique, Développement, Biologie Structurale

Scientific domains

The scientific goal of the unit is to understand plant health in relation to detrimental as well as beneficial microbes in light of the changing climate. The unit aims to develop alternative strategies of disease control that can reduce use of traditional pesticides.

Specifically, the unit studies grapevine and some of its diseases (Grapevine Trunk Diseases and grey mould) and how these diseases affect plant physiology. The focus of the lab is to understand how these diseases can be controlled by using beneficial microbes or compounds derived from them. The experimental approaches include work conducted directly with grapevine as well as with the model plant *Arabidopsis thaliana*. The group is starting and will continue to extend these approaches to other crops, such as Brassicas and wheat. In the next five years, the group will also work on understanding how changes in climate might affect plant physiology, induction of plant immunity and responsiveness to beneficial microbes.

Unit workforce

Unit workforce	Number on 30/06/2016	Number on 01/01/2018
N1: Permanent professors and similar positions	19	18
N2: Permanent researchers from Institutions and similar positions		
N3: Other permanent staff (technicians and administrative personnel)	9	9
N4: Other researchers (Postdoctoral students, visitors, etc.)		
N5: Emeritus	3	
N6: Other contractual staff (technicians and administrative personnel)	4	
N7: PhD students	13	
TOTAL N1 to N7	48	
Qualified research supervisors (HDR) or similar position	8	

Unit record	From 01/01/2011 to 30/06/2016
PhD theses defended	12
Postdoctoral scientists having spent at least 12 months in the unit	6
Number of Research Supervisor Qualifications (HDR) obtained during the period	

2 • Assessment of the unit

Global assessment of the unit

The general scope of the research lies in the biochemical and molecular characterization of plant-microbe interactions in light of climate change. The lab members aim to elucidate how microbial elicitors affect disease resistance in plants and to validate the lab results in the field. The longer term goal of the lab is to exploit the identified molecules for crop protection through biotechnology. Other avenues of research investigate the rhizosphere composition and analyze the signals that comes from roots to shoots to induce disease resistance. Finally, the lab aims to extend their study to examine the role of abiotic stress, such as temperature fluctuation that are caused by extreme weather conditions, and its effect on beneficial and detrimental interactions with microbes as well as on health of the plant immune system. The group is focused on specific class of compounds released by microbes and their effect on plant physiology. Although many labs work in the field of induced immunity elicitation, the group here sets itself apart by working with grapevine, a woody perennial plant of high economic importance, and arabidopsis as a model plant organism. The group studies fungal diseases detrimental to grape - grey mould and grapevine trunk diseases.

The unit has an extensive track record in working with grapevine, understanding grapevine physiology and use of beneficial microbes in plant health. The scientific quality and outputs are very good, especially given the small number of scientists with high teaching and administrative load, but the unit may probably reach higher impact journals with wider readership. Many projects have been obtained from EU, ANR, FUI, showing the strong recognition of the research expertise of the unit. The interaction with the socio-economic environment is very good, but could be still improved through strong partnerships with stakeholders, and there is a tendency to dispersion in the research of funding. The unit is well organized although it suffers from an obvious lack of administrative staff. Unit members are strongly dedicated to teaching in various courses, and in training of PhD students. Yet, the length of the thesis is significantly longer than recommended, and interaction between PhD students and foreign scientists should be encouraged. The project of the unit is very good, but risky and still too wide. The unit really needs in house good expertise in phytopathology and this cannot be achieved via collaborations.