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## IGEPP - Institut de génétique, environnement et protection des plantes

Rapport Hcéres

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# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

HCERES report on research unit:

Institute for Genetics, Environment and Plant Protection

IGEPP

Under the supervision of  
the following institutions  
and research bodies:

Institut National de Recherche en Agronomie - INRA

Agrocampus Ouest - Institut supérieur des sciences  
agronomiques, agroalimentaires, horticoles et du  
paysage

Université de Rennes 1

Evaluation Campaign 2015-2016 (Group B)

# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

*In the name of HCERES,<sup>1</sup>*

Michel COSNARD, president

*In the name of the experts committee,<sup>2</sup>*

Pere ARUS, chairman of the committee

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Under the decree N<sup>o</sup>.2014-1365 dated 14 november 2014,

<sup>1</sup> The president of HCERES "countersigns the evaluation reports set up by the experts 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)

## 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:** Institute for Genetics, Environment and Plant Protection

**Unit acronym:** IGEPP

**Label requested:** UMR

**Current number:**

**Name of Director  
(2015-2016):** Mr Denis TAGU

**Name of Project Leader  
(2017-2021):** Ms Maria MANZANARES-DAULEUX

## Expert committee members

**Chair:** Mr Pere ARUS, IRTA, Spain

**Experts:**

- Mr José María ÁLVAREZ-CASTRO, Universidade de Santiago de Compostela, Spain
- Ms Rossitza ATANASSOVA, University of Poitiers (representative of the CNU)
- Mr Josep CASACUBERTA, CSIC, Spain
- Mr Jean-Pascal GOUTOULY, INRA, Bordeaux
- Mr Stanley LUTTS, Catholic University of Louvain, Belgium
- Mr Philippe REYMOND, University of Lausanne, Switzerland
- Ms Sharon ZYTINSKA, Technische Universität München, Germany

**Scientific delegate representing the HCERES:**

Mr Serge DELROT

Institute for Genetics, Environment and Plant Protection, IGEPP, INRA, Agrocampus Ouest, U Rennes 1,  
Ms MANZANARES-DAULEUX

Representatives of supervising institutions and bodies:

Ms Carole CARANTA, INRA, BAP

Mr Romain JEANTET, Agrocampus Ouest

Mr Claude LABIT, Université de Rennes 1

Mr Christian LANNOU, INRA, SPE

Head of Doctoral School:

Ms Nathalie THERET, Doctoral School VAS n° 92 « Vie Agronomie Santé »

## 1 • Introduction

### History and geographical location of the unit

The Institute for Genetics, Environment and Plant Protection (IGEPP, was created in 2012 as a “Unité Mixte de Recherche” (UMR) merging two former UMRs: Plant Breeding and Biology (APBV) and Biology of Organisms and Populations applied to Plant Protection (BiO3P).

Its main geographical location is at the facilities of INRA Le Rheu, close to Rennes. Other sites are INRA Ploudaniel in western Brittany where are located 31 employees, and the campuses of the University of Rennes 1 (14 employees), Agrocampus Ouest-Rennes (20 employees) and Agrocampus Ouest-Angers (10 employees). Altogether, IGEPP gathers more than 250 staff, the majority belonging to INRA divisions Plant Health and Protection (SPE), and Plant Breeding (BAP)

### Management team

Present director: Mr Denis TAGU

Future director: Ms MANZANARES-DAULEUX

Deputy director(s): Not yet designated

### HCERES nomenclature

Main scientific domain: SVE

Scientific subdomain: SVE2

Major subdomain: SVE2\_LS8

Secondary subdomain: SVE1\_LS2

### Scientific domains

The research of IGEPP is based on the integration of various scientific disciplines (genetics, genomics, bioinformatics, modelling, ecology, evolutionary biology, epidemiology, pathology, entomology, agronomy, physiology, cell biology, molecular biology and biochemistry) to understand the biology of a set of crop species (mainly rapeseed, potato, pea and wheat) and associated organisms (pests, pathogens and their natural enemies). This work is conducted at different scales: organism (molecules, cells, individuals, communities), space (in vitro culture, greenhouse, field, agroecosystem) and time (cell reaction to evolutionary scale).

### Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	23	24
N2: Permanent researchers from Institutions and similar positions	56	59
N3: Other permanent staff (technicians and administrative personnel)	126	116
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)		
N6: Other contractual staff (technicians and administrative personnel)	23	
N7: PhD students	25	
<b>TOTAL N1 to N7</b>	<b>253</b>	
Qualified research supervisors (HDR) or similar positions	21	

Unit record	From 01/01/2010 to 30/06/2015
PhD theses defended	37
Postdoctoral scientists having spent at least 12 months in the unit	24
Number of Research Supervisor Qualifications (HDR) obtained during the period	5

## 2 • Overall assessment of the unit

### Introduction

IGEPP is a large research unit that was created four years ago from the merging of two pre-existing units (APBV and Bi03P). Its objective is to describe, understand and predict the functioning of plants, their associated organisms and the agroecosystems, in order to contribute to the development of new methods improving plant health and protection against biotic and abiotic aggressions, while maintaining the biodiversity and health of agroecosystems. Research at IGEPP is focused on three basic scientific domains: 1) Biodiversity of plants and associated organisms, 2) Plant response and adaptation of associated organisms to biotic and abiotic stresses, and 3) Agroecosystems functioning. The activities are conducted by five research teams of different sizes covering a broad scope of interrelated research subjects, and with a vision of final application to solve specific problems of the French and European agricultural sector. The research encompasses a diverse set of field crops, mainly rapeseed, potato, pea and wheat and their main associate organisms (pests, pathogens and natural enemies of these). Furthermore, the unit is

supported by six internal technological platforms on Bioinformatics for Arthropods, Genetic Resources (*Brassica*, *Solanum*, *Allium* and *Cynara*), Cytogenetics, Metabolomics, Molecular Biology and Greenhouses.

One of the objectives of the unit in the evaluated period was to integrate the researchers who were in the different founder units without losing scientific impact and attraction. This was particularly important in two teams: Ecology and Genetics of Insects and Resistance and Adaptation, which are the largest (72 and 88 employees, respectively) and where the assembly of the different groups was more complex. This was in agreement with the recommendations of the previous evaluation committee that were generally followed by the research unit. The outcome after this period of adaptation is positive with clear evidences of a stronger interaction among researchers within the same team and between teams, and a further integration of the different research areas.

### Global assessment of the unit

The research unit has a rich and high-quality scientific production, with an increasing proportion of papers published in the highest impact journals in general, or in specific disciplines. The relationship with the industry is strong and long-term, with plant materials and innovative results being transferred to the main stakeholders. IGEPP has also a significant training record in collaboration with the University of Rennes 1 and Agrocampus Ouest that are part of the unit. During this period, the unit has consolidated its already important national leadership and appeal and enhanced its international focus and visibility. The merging of the founder units has been achieved without any evident loss of overall scientific capability. A new internal organization has been created that is in general operative and relatively satisfactory for most groups of staff, but that still requires additional polishing to improve its acceptance. The possible synergies between research teams are numerous, and some of which are starting to emerge. The vision of transversal work has been embraced by IGEPP, and incorporated in the program for the following period.

### Strengths and opportunities in the context

IGEPP is a group of high-profile researchers with an abundant production of scientific papers of high impact.

There is a well-established network of collaborations with the breeding and producing sectors that has already resulted in long-term partnerships and several success stories.

The ensemble of teams incorporates an ample range of disciplines and species, which allows tackling agricultural problems with a global and transversal vision.

The research is supported by a set of platforms that provide services to stakeholders and supply the research teams with essential technologies required for the development of their scientific activity.

IGEPP strong points are opportunities for expanding the influence of the group at the international level, by enhancing its leadership in European/international projects.

Having a well-defined and planned Biomathematics and Bioinformatics support is critical for the future expansion of the unit.

### Weaknesses and threats in the context

The sources of economic support for research have changed in the recent years. IGEPP has to adapt to these changes and insure sufficient funding for the development of its future research strategy.

The trend towards a lower proportion of permanent personnel requires changes in planning future recruitments and in internal organization of the research unit.

IGEPP is well known and respected at the international level, but it needs to implement additional internationalization actions in its internal life.

The renewal of facilities of certain technological platforms (greenhouses) and the adequate evolution of others (Bioinformatics, Metabolomics, Genetic resources, Cytogenetics) is needed for the achievement of the research unit's goals.



## Recommendations

Financial resources (income without permanent personnel) for IGEPP have recently diminished, and although the number of certain contracts (including ANR and PIA projects) has grown, this has not been enough to compensate for the decrease of funds from other sources. The next 4-5 years are crucial to increase the funding of IGEPP and insure the maintenance of its current size and capabilities. IGEPP director and team leaders should elaborate a clear strategy in this respect, assuring that researchers are aware of this threat and committed to a more active search for funding that would secure a good and stable financial base for the unit. One option is a more intense participation in competitive national and international projects. Another source could be with the companies already working with IGEPP, to search for stronger economic support or new ways of cooperation that would improve the current income.

The trend towards a lower proportion of permanent personnel may have other implications, as it may remodel the proportions of employees of certain personnel categories. Research personnel in training may increase (Pre and Post-docs) at the expense of the decrease of certain types of technicians. This may result in significant changes in the capabilities of the unit, with the possible loss of certain skills (cytogenetics, insect classification, among others) due to the retirement engineers and technicians. It would be important to foresee these changes and to have appropriate and realistic recruitment policies avoiding unwanted effects on the capabilities of the research unit.

The director of the unit and its five deputy directors succeeded in establishing a good structure for participation and decision-making after the merging of the two founder units four years ago. Talking with different groups of employees confirmed that the current organization was satisfactory to the majority of them in most aspects of their professional life. This is a good starting point for the new director, but the creation of IGEPP was a complex process and still requires additional polishing and continuous adjustment (at the unit and team levels) to insure that there is a balanced distribution of responsibilities and an adequate flow of communication to improve employee satisfaction and efficiency.

The new director is a member of the university in a research unit where a large majority of employees come from INRA. It would be important that the director be completely released from any duties other than heading the unit, so she has a full-time dedication to this task. Enforcing the functions of one of the deputy directors coming from INRA by the delegation of specific responsibilities is also recommended.

The high profile of some of the scientists of the unit allows seeking international projects that may increase the international visibility of the research unit and, at the same time, help its financing. The application to the ERC program - advanced, consolidator or starting grants, the coordination of H2020 large projects, or projects from other international private or public sources should be the targets for the next period.

The research unit involves a multidisciplinary analysis of the functioning of various crops, their bioaggressors, and their interactions within agroecosystems, which is a complex analysis that requires a very solid Biomathematics and Bioinformatics support. The unit has to define in detail the objectives of the proposed Biomathematics ("Demecology") new team and its connections with the other research teams, so this new group is operative within the next months. For Bioinformatics, it is urgent to set up the IGEPP platform, and to guarantee that all teams have a satisfactory level of support in this particular area.

The implementation of a program of seminars with invited speakers, key scientists in the areas of interest of IGEPP coming mainly from abroad, would contribute to the internationalization of the research unit. These seminars would also be part of the training of PhDs and post-docs and increase the appeal of the unit. Introducing strong elements of internationalization in the new recruitment policies for researchers (all kinds) and searching for PhD students financed by other countries are clearly within what the unit can do. Expanding the use of English as the language of scientific communication within IGEPP employees in general, but particularly for young trainees, is also recommended.