

GLYCOMEV - Glycobiologie et matrice extracellulaire végétale

Rapport Hcéres

► **To cite this version:**

Rapport d'évaluation d'une entité de recherche. GLYCOMEV - Glycobiologie et matrice extracellulaire végétale. 2016, Université de Rouen. hceres-02034815

HAL Id: hceres-02034815

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Submitted on 20 Feb 2019

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HCERES

High Council for the Evaluation of Research
and Higher Education

Research units

HCERES report on research unit:

Glycobiologie et Matrice Extracellulaire

Glyco-MEV

Under the supervision of the following
institutions and research bodies:

Université de Rouen

HCERES

High Council for the Evaluation of Research
and Higher Education

Research units

In the name of HCERES,¹

Michel Cosnard, president

In the name of the experts committee,²

Paul Knox, 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 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: Glycobiologie et Matrice Extracellulaire Végétale

Unit acronym: Glyco-MEV

Label requested: EA

Current number: 4358

**Name of Director
(2015-2016):** Mr Patrice LEROUGE

**Name of Project Leader
(2017-2021):** Mr Patrice LEROUGE

Expert committee members

Chair: Mr Paul KNOX, University of Leeds, UK

Experts: Ms Angela FALCIATORE, CNRS, Paris

Mr Herman HÖFTE, INRA, Versailles

Mr Jean-Pierre JACQUOT, Université de Lorraine (representative of the CNU)

Scientific delegate representing the HCERES:

Mr Steven BALL

Representatives of supervising institutions and bodies:

Mr Cafer ÖZKUL, Université de Rouen

Mr Laurent YON, Université de Rouen

Head of Doctoral School: Mr Vincent RICHARD, Doctoral School n°497, NBISE, École Doctorale Normande Biologie Intégrative, Santé, Environnement

1 • Introduction

History and geographical location of the unit

Glyco-MEV “Glycobiologie et Matrice Extracellulaire Végétale” is a plant science research unit in the region of “Haute-Normandie” that has evolved from previous research units extending back to the 1970s. Glyco-MEV has been in its current incarnation since 2010 when it was established by Mr Patrice LEROUGE and Mr Azeddine DRIOUICH.

In 2015 Glyco-MEV comprised 19 permanent staff (including 12 professors/assistant professors and 7 technicians). These numbers have been broadly static since 2010. Over the contract period, the staff was aided by 13 PhD students which is a significant increase since 2009.

Glyco-MEV is currently based in an old biology building on the Mont-Saint-Aignan campus (occupying 1,200 m² of space) and is set to move in January 2016 to 1,600 m² of new space in CURIB (“Centre Universitaire de Recherche et d’Innovation en Biologie”). This will enable increased interaction with Cell Imaging and Proteomics IBISA-affiliated platforms to which Glyco-MEV staff members are major contributors. 2015 has also seen access to new plant growth/greenhouse facilities the nearby “Plateforme expérimentale Normand Serre”. This plant growth facility has over 700 m² of space, including space dedicated to transgenic plants and for studies of plant-pathogen interactions.

The research focus of Glyco-MEV is plant glycobiology.

Management team

Since 2010 Glyco-MEV has been managed by a research unit director aided by a deputy director. Administration and financial services are managed by 8 members of staff. Through the evaluation period Glyco-MEV encompassed three scientific research teams on defined topics although with extensive interactions and significant synergistic cooperativity.

HCERES nomenclature

Domaine: SVE

Sous-domaine: SVE2

Sous domaine principal: SVE2-LS3

Scientific domains

The research area of the unit is plant glycobiology and this includes plant root secretions/defense, cell wall biosynthesis/remodelling and N-glycosylation in plants and algae.

Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	12	12
N2: Permanent researchers from Institutions and similar positions		
N3: Other permanent staff (technicians and administrative personnel)	7	7
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)	1	
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	3	
N6: Other contractual staff (technicians and administrative personnel)	1	
N7: PhD students	13	
TOTAL N1 to N7	37	
Qualified research supervisors (HDR) or similar positions	6	

Unit record	From 01/01/2010 to 30/06/2015
PhD theses defended	13
Postdoctoral scientists having spent at least 12 months in the unit	7
Number of Research Supervisor Qualifications (HDR) obtained during the period	2

2 • Overall assessment of the unit

Introduction

Glyco-MEV is a single laboratory that researches in the area of plant glycobiology. Within this research area, Glyco-MEV has three research topics in the current contract:

- I) plant root defenses including root border cells;
- II) cell wall glycomolecules & cell growth;
- III) N-glycosylation pathways in plants and microalgae.

The research on root defense focuses largely on experimental systems and a range of plant cell wall molecules including pectic polysaccharides and the O-glycosylated plant proteoglycans arabinogalactan-proteins (AGPs). The complex pectin family of polysaccharides are also a clear focus in topic II and this, and the increasing use of small inhibitor molecules, allows for excellent cross-fertilization between topics I & II. The proposed strategy for the next contract requires only a minor re-defining of the 3 topics - but includes a proposal for two cross-cutting projects/technology platforms i.e. cell imaging of glycomolecules and the use of small inhibitor glycomolecules. This proposal should integrate the laboratory even more strongly.

Global assessment of the unit

Glyco-MEV is a small research unit that is a center of excellence in plant glycobiology and one of the major such centers in Europe. The centre is run as a one-team research laboratory with clear flexibility in the use of its technical support. Glyco-MEV has an admirable research focus, and this has resulted in exceptional interactions and synergy between its research topics - and in particular between topics I and II. All teams have been successful in attracting funding. Outputs over the previous 5 years provide evidence of an increasing research trajectory in terms of publication outputs, the number of PhD students and the number of research contracts. The number of private contracts appears to have been increased significantly. Publication outputs are at a high level and are generally in top ranking international plant science and associated specialist journals.

Strengths and opportunities in the context

- under the current direction the unit has an exceptional supportive research environment that is appreciated by all staff and student researchers. This positive and participative environment clearly contributes to the strength of the research unit and its outputs;

- young researchers are actively encouraged to take an active role in research activity;
- planning has been made for the training of future directors;
- active participation in regional, national and international research programmes;
- internationally recognized research;
- laboratory acts as one research team, which maximizes outputs from a limited number of projects;
- very high level of research interactions and co-authorship;
- upward trajectory in terms of research activity (outputs/PhD students/research contracts);
- excellent research culture across the research unit with regular series of meetings that address different needs;
- enhancement of capabilities by improved infrastructures including imminent movement to a new building and access to new plant growth facilities;
- increasing research links and partnerships with industry including Agilent;
- good employability of PhD students;
- proposal for transverse projects/tool development that cut across all topics that should boost synergy;
- technical staff is deployed flexibly and is responsive to shifting research needs.

Weaknesses and threats in the context

- the absence of a formal association with the INRA or CNRS;
- provision of technical support is currently overstretched and there are issues around the continuity of specialist expertise;
- there is a risk that the limited technical resources may become further overstretched by providing technical services to external users;
- is technical support sufficient in areas of plant pathology and diatom genetic analysis?
- limited use of molecular and genetic tools in the microalgal work;
- the high teaching load and the inclusion in the unit of teaching-focused staff threatens the research competitiveness in particular in some fast-moving research topics;
- geographical isolation as the only plant laboratory in the Rouen area.

Recommendations

The panel recognizes the effectiveness of the strong one laboratory-one team ethos and its focus on collaborative projects. In relation to its small size and geographic isolation, the unit has been highly successful in its scientific outputs. Over the evaluation period a trend towards a research strategy being driven by funding opportunities can be observed, and the panel recommends that the unit builds upon their strengths, including innovative tools and expertise; and there is a particular potential in research on the wider biological questions related to root-microbe-soil interactions and microalgal glycobiology.

In relation to the first recommendation, the panel suggests the unit considers the training or the hiring of new research staff that would bring to the unit relevant expertise in, for example, plant root-microbe interactions, microalgal genetics and molecular biology.

In relation to the unit's small size and isolation, it should also consider the development of strategic partnerships with, for example, CNRS and/or INRA and with other university units. Such partnerships will enable the unit to fully exploit its expertise and its strengths as an internationally important unit for plant glycobiology.

Technical support to unit researchers at all levels is apparently overstretched - a problem that will be exacerbated with some staff deployment to the new plant growth facility in 2016. The unit should find ways to overcome these issues as much as possible. It is recommended that the unit finds a way to implement the establishment of new permanent technical support positions to both ensure the continuity of research expertise and to maximise research outputs.

Concerning the technical support, there appears to be serious concerns around career structures and career opportunities in terms of both permanence and promotions and the unit should address these issues.

The panel recommends that the unit increases its internationality by considering the coordination or participating in more ANR and EU programs. This would be facilitated by improving the administrative support available for the submission of grant applications and related activities.

There is clear potential to increase the number of PhD students & their internationality and the unit should devise strategies to increase the number of HDRs and their attractiveness to international candidates.