

FINAL RESUME ON THE RESEARCH UNIT NuMeCan - Nutrition, Metabolisms and Cancer institute

UNDER THE SUPERVISION OF THE FOLLOWING INSTITUTIONS AND RESEARCH BODIES:

Université de Rennes 1

Institut national de la santé et de la recherche
médicale - INSERM

Institut national de recherche pour l'agriculture,
l'alimentation et l'environnement - INRAE

EVALUATION CAMPAIGN 2020-2022 GROUP B



In the name of Hcéres¹:

Mr Thierry Coulhon, President

In the name of the experts committee²:

Mr Michelangelo Foti, Chairman of the
committee

Under the decree No.2014-1365 dated 14 November 2014,

¹ The president of Hcéres "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 experts committee". (Article 11, paragraph 2).

Tables in this document were filled with certified data submitted by the supervising body on behalf of the unit.

UNIT PRESENTATION

Unit name:	Nutrition, Metabolisms and Cancer institute
Unit acronym:	NuMeCan
Current label and N:	UMR1241/UMR1341
ID RNSR:	201722267J
Application type:	Restructuration
Head of the unit (2017-2021):	Mr Bruno Clément
Project leader (2022-2026):	Mr Olivier Loréal
Number of teams:	3

EXPERTS COMMITTEE MEMBERS

Chair:	Mr Michelangelo Foti, Université de Genève, Suisse
Experts :	Mr Rodolphe Anty, CHU de Nice (representative of CNU)
	Ms Vassilia Bayle Theodorou, École d'Ingénieurs de Purpan, Toulouse (representative of CSS INRAE)
	Ms Emmanuelle Fouilloux-Meugnier, INRAE, Pierre Bénite (supporting personnel)
	Ms Antonella Nai, Ospedale San Raffaele, Milan, Italy
	Ms Valérie Paradis, Hôpital Beaujon/INSERM, Paris (representative of CSS Inserm)
	Mr Olivier Tillement, Université Lyon 1, Lyon

HCÉRES REPRESENTATIVE

Mr Jean-Edouard Gairin

REPRESENTATIVES OF SUPERVISING INSTITUTIONS AND BODIES

Mr David Alis, Université de Rennes 1

Mr Raymond Bazin, INSERM

Mr Lionel Brétilon, INRAE

Mr Christian Boitard, INSERM

Mr Michel Cogné, Université de Rennes 1

Mr Frédéric Delaleu, INSERM

Mr Thierry Lesimple, Centre Eugène Marquis (partenaire)

Ms Hélène Lucas, INRAE

Mr Frédéric Rimattei, CHU de Rennes (partenaire)

INTRODUCTION

HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

The NuMeCan Institute (Nutrition, Metabolisms and Cancer (University of Rennes 1, UMR-1241 Inserm and UMR 1341 INRAE)) was created in 2017 by grouping three previously existing structures, i.e., "Liver, Metabolisms and Cancer" Inserm/ University of Rennes1 Unit n°991, "Food and Digestive, Nervous and Behavioral Adaptations" (ADNC) INRAE Unit n°1341, and "Microbiology and Infectious Risks" University of Rennes1 Unit (EA1254).

Under the direction of Mr Bruno Clément, four research teams (with the acronyms NGB, CIMIAD, EXPRES and TGTC) brought together their complementary expertise to foster basic, translational and clinical research aiming at investigating the impact of nutrients, environment and behavior on chronic metabolic diseases and cancer in order to develop new diagnostic tools, therapeutic interventions and prevention strategies for these diseases. These integrated objectives were designed based on the longstanding and recognized research tradition in Rennes focusing on basic and clinical hepatology (since 1964), the adaptive mechanisms of the digestive system with the central nervous system and eating behaviors (since 2012) and the mechanisms involved in the pathogenicity of microorganisms (microbiota and others, since 1992). The unit proposes for the next contract a three-team structuration (NGB/EAT, EXPRES, METHER, the latter being the merge of CIMIAD and TGTC teams).

These teams are spread on two different locations distant of thirteen km with appropriated connection facilities (motorway and metro in 2021). Three teams (CIMIAD, EXPRES and TGTC) are located in the University-hospital campus of Villejean-Pontchaillou (University of Rennes 1 and Rennes hospital, 2100 m² available) and one team (NGB) in building located in Saint-Gilles (1985 m² available). Laboratory and office spaces are available for sharing in the two locations in order to favor scientific exchanges and interactions between all teams.

The clear objectives of the unit are to integrate various expertise in basic and clinical gastroenterology, nutrition and behavior to investigate the impact of food, environment and behavior on the development of chronic metabolic diseases affecting the liver, the digestive tract and the brain, and which may ultimately result in the development of various cancer. The different teams are active in various research field including i) the adaptive mechanisms of the gut-brain axis modulated by food, toxins and eating behaviors, ii) the control of iron metabolism and iron-associated diseases of the liver and of the osteo-articulations, iii) the impact of various stresses (lipids, xenobiotics, sepsis, hypoxia, surgery, ..) on molecular mechanisms promoting cell/tissues damages and repair, as well as iv) the role of TGF beta and glutathione homeostasis in pancreatic and liver cancers, as well as the development of novel strategies for liver-specific drug delivery.

The ultimate goal of merging together these teams in the same unit is to develop new diagnostic tools, therapeutic interventions and prevention strategies for chronic metabolic diseases of the digestive tract and associated cancers.

RESEARCH ECOSYSTEM

The unit is well integrated in the general strategic vision of both University of Rennes 1 and CHU, which develops priorities in the management of nutrition-related metabolic diseases and cancer. NuMeCan research benefits also from the proximity in the university of numerous other research groups working in different areas of interest. NuMeCan's members are involved in post-graduate teaching of molecular/cell biology and microbiology and have strengthen training and continuous education of juniors and researchers through the creation of a new Master in Nutrition and Health. A scientific focus group (GIS, sponsored by regional universities, hospitals and institutions and a "Contrat Plan État Region" (CPER 2015)) named "Nutrition, Alimentation, Métabolisme et Santé" (NAMS) gathering diverse units/entities was also founded in 2014 to foster multidisciplinary approaches.

The unit establishes and constantly encourages reciprocal tight and productive interactions between basic and clinician researchers active in multiple departments and specialties (including digestive, locomotor, anesthesiology, odontology, biology, pediatric, hepatology and transplantation, radiotherapy, ...) of the CHU, the Center for Clinical investigation, the "Centre de Lutte contre le Cancer", the Regional cancer center and the biobank CRB-Santé. In this regard, Pls of the NuMeCan unit are members/founders of various reference clinical centers specialized in nutrition, digestive and hepatic diseases, bone and connective tissues-related diseases and cancers. NuMeCan scientists also actively collaborate with other teams with different expertise (e.g., chemical sciences, milk/eggs sciences and technology, mathematics) located in various institutes/universities of Rennes thus outlining again the multidisciplinary nature of NuMeCan research.

Numerous core facilities in Rennes mostly coordinated by the UMS Biosit were either created or are currently managed by NuMeCan members (e.g., precision histopathology, multimodal imaging and spectroscopy platform, vector biosynthesis, surgical simulation, pig facility and a university-hospital biobank CRB-Santé). Of importance, the creation of new organoids and cell metabolism facilities by the unit are underway.

Finally, at the regional/interregional levels, the unit founded and participates to the steering and strategic committee of the Carnot Institute "Agrifood transition" promoting academic and industrial partnerships, and is

enrolled in two clusters fostering academic collaborations with SME in Brittany, the Canceropôle Grand-Ouest clustering teams from Inserm, CNRS, university/hospital and socio-economic partners, as well as of the "Centre de Recherches en Nutrition Humaine" gathering research units from Nantes, Angers and Rennes.

HCÉRES NOMENCLATURE AND THEMATICS OF THE UNIT

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MANAGEMENT TEAM

The unit's head for this last mandate was Mr Bruno Clement assisted by two deputy directors, i.e., Mr David Val Laillet and Mr Olivier Loréal. For the next contract the NuMeCan unit will be headed by Mr Olivier Loreal with two new deputy directors, i.e., Ms Gaëlle Boudry and Ms Anne Corlu.

UNIT WORKFORCE

NuMeCan		
Active staff	Number 06/01/2020	Number 01/01/2022
Full professors and similar positions	23	22
Assistant professors and similar positions	13	13
Full time research directors (Directeurs de recherche) and similar positions	6	6
Full time research associates (Chargés de recherche) and similar positions	6	7
Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.")	0	0
High school teachers	0	0
Supporting personnel (ITAs, BIATSSs and others, notably of EPICs)	31	27
Permanent staff	79	75
Non-permanent professors and associate professors, including emeritus	2	
Non-permanent full time scientists, including emeritus, post-docs (except PhD students)	18	
PhD Students	25	
Non-permanent supporting personnel	0	
Non-permanent staff	45	
Total	124	75

GLOBAL ASSESSMENT OF THE UNIT

The NuMeCan unit, composed of three teams (NGB/EAT, EXPRES, METHER) for the next contract, investigates the impact of food, environment and behavior on the development of chronic metabolic diseases affecting the liver, the digestive tract and the brain, and which may ultimately result in the development of various cancer.

The quality of the research in the unit and scientific production is overall very good with some disparities between the teams (excellent for EXPRES, this latter having an international recognition in the field of liver toxicity induced by xenobiotics and lipids, very good for NGB/EAT and METHER). The number of important national and international grants obtained in the previous contract is also very good. The recruitment, supervision and training of Master and PhD students in the unit is excellent with in particular a very good number of students having completed their PhD during the previous contract and an excellent professional integration afterwards. The visibility, recognition and attractiveness of the unit is excellent at the national level, while in general is rather limited at the international level.

All teams are well integrated in the unit and local environment, have built up very good and multidisciplinary interactions between basic scientists and clinicians, as well with local socio-economic partners. Interactions between the teams is usually very good further supported by an important number of collaborative publications, common and transversal interests in microbiota and inflammation research, as well as by the use of transversal platforms. Interactions between the two teams merged in the new METHER team are however currently poor and need to be reinforced.

The organization and life of the unit is overall very good. Improvements in gender parity with regards to managerial functions associated with the hospital and university are however required, as well as in communication with the technical staff.

The research themes developed by the unit are excellent and of major interest for the public health. The next contract projects for all teams are very good based on their respective expertise. Strategies implemented to mutualize financial resources and to build up transversal platforms and innovative technologies of common interest are very good but the requested financial/human resources for platform development are poorly evaluated. The plan to develop during the next contract bioinformatic and statistical tools in collaboration with mathematician/bioinformatician/statistician groups to enter the big data era is very good. Finally, strategies to improve the visibility, international recognition and attractiveness of the unit is good, but major efforts should be invested in attracting foreigner scientists and funds.

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