

Research evaluation

FINAL RESUME ON THE RESEARCH UNIT: Muscle Dynamic and Metabolism (DMEM)

UNDER THE SUPERVISION OF THE FOLLOWING INSTITUTIONS AND RESEARCH BODIES: Université de Montpellier Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement -INRAE

EVALUATION CAMPAIGN 2019-2020 GROUP A

Report published on March, 25 2020



In the name of Hcéres¹:

In the name of the experts committee²:

Nelly Dupin, acting President

Carlo Reggiani, 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 data submitted by the supervising body on behalf the unit.

UNIT PRESENTATION

| Unit name: | Muscle Dynamic and Metabolism |
|-----------------------------------|-------------------------------|
| Unit acronym: | DMEM |
| Current label and N°: | UMR0866 |
| ID RNSR: | 199917397U |
| Application type: | Renewal |
| Head of the unit (2019- 2020): | Ms Anne Bonnieu |
| Project leader (2021-2025): | Ms Anne Bonnieu |
| Number of teams and/or themes: | 2 |

EXPERTS COMMITEE MEMBERS

| Chair: | Mr Carlo Reggiani (Professeur émérite), University of Padova, Italy |
|----------|--|
| | Mr Patrick Decherchi, Aix-Marseille Université (representative of CNU) |
| Experts: | Ms Bénédicte LEBRET, INRAE, Saint-Gilles (supporting staff) |
| | Ms Sophie Tesseraud, INRAE, Nouzilly (representative of CSS INRAE) |

HCÉRES REPRESENTATIVE

Mr Jean-François Hocquette

REPRESENTATIVES OF SUPERVISING BODIES

Mr Jean Dallongeville, INRAE

Ms Françoise Medale, INRAE

Mr Jacques Mercier, Université de Montpellier

INTRODUCTION

HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

The Muscle Dynamics & Metabolism (DMEM) unit is located at the INRAE site of Occitanie-Montpellier. The whole research activity of the unit is dedicated to the study of muscle structure and functions. Originally composed of INRAE staff from The Animal Physiology and Livestock Systems (Phase) Division of INRAE, the unit was later enriched with personnel from the University of Montpellier 1 and 2, SupAgro and Inserm and became in 1998 a joint UMR research unit between INRAE and University of Montpellier. Scientific staff from Human Nutrition (AlimH) Division of INRAE also joined the unit in the 2000s. Initially called "Cell Growth and Differentiation", the unit was later called "Muscle Dynamics and Metabolism" or DMEM ("Dynamique Musculaire et Métabolisme").

Management team

The unit is directed by A. BONNIEU with two deputy directors F. CASAS and V. OLLENDORFF.

HCÉRES NOMENCLATURE

SVE2_3 Biologie cellulaire, biologie du développement animal

SVE5_1 Physiologie, Endocrinologie, Physiopathologie

SHS4_4 Sciences et techniques des activités physiques et sportives

THEMATICS

The field of research of DMEM Unit is the regulation of skeletal muscle homeostasis with specific attention to its relation with physical activity/inactivity and nutrition and with the application of the relevant knowledge to health and agriculture. More specifically the two teams of the unit develop different and complementary lines of research. EMN or Team1 studies the role of muscle metabolism related to mitochondrial activity in the development of muscle phenotypes and its modulation through nutrition. RMS or Team2 studies the regulation of muscle mass, its determinants, the intracellular signaling pathways which mediate the impact of external factors such as physical activity/inactivity or nutrition.

The different backgrounds and the expertise of the researchers cover cellular and molecular biology, nutrition and physiology of muscle and physical exercise. This allows an integrative physiological approach to the functional, cellular and molecular mechanisms involved in the homeostasis of adult skeletal muscle, with specific attention to the underlying mechanisms and to the impact of exercise/disuse and nutrition.

UNIT WORKFORCE

| Muscle Dynamic and Metabolism (DMEM) | | |
|---|----------------------|----------------------|
| Active staff | Number 06/30/2019 | Number 01/01/2021 |
| Full professors and similar positions | 2 | 2 |
| Assistant professors and similar positions | 5 | 5 |
| Full time research directors (Directeurs de recherche) and similar positions | 5 | 5 |
| Full time research associates (Chargés de recherche) and similar positions | 4 | 4 |
| Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.") | 0 | 2 |
| High school teachers | 0 | 0 |
| Supporting personnel (ITAs, BIATSSs and others, notably of EPICs) | 19 | 17 |
| Permanent staff | 35 | 35 |
| Non-permanent professors and associate professors, including emeritus | 0 | |

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| Non-permanent full time scientists, including emeritus, post-docs (except PhD students) | 1 | |
|---|----|----|
| PhD Students | 10 | |
| Non-permanent supporting personnel | 2 | |
| Non-permanent staff | 13 | |
| Total | 48 | 35 |

GLOBAL ASSESSMENT OF THE UNIT

With a successful history extending over a decade and with a position at the edge between University of Montpellier and INRAE, the unit shows high potential for fully active and productive research life. The field of interest is represented by skeletal muscle function, which is investigated under multiple perspectives from molecular and intracellular mechanisms, to metabolic aspects, interactions with whole body functions (including physical activity) and impact of nutrition. This multi-scale approach from molecules to whole body offers the possibility to combine basic science and translational application to human health as well as to agronomy and animal science. The scientific output in terms of publications on scientific journals is constant in quantity and good in quality. The economical support provided by INRAE and MU is largely integrated by access to grants based on successful applications of the unit's members. The links with European COST networks and the regional and national collaborations give the possibility to be open to a wider context. There are also a number of interactions with companies active in the field of nutrition and with local and national socio-economical players.

Professors and assistant professors of the UM represent a very important component of the unit staff. They provide a strong link with the license and master courses of the UM and open the unit to the internships of many undergraduate students every year. Members of the unit staff are involved in two doctoral schools and this has allowed the presence of Ph students who prepare and defend their thesis in the units. In turn, the PhD students give a significant contribution to the research carried out by the unit as demonstrated by the number and the quality of the articles published in relation to their doctoral theses. Although qualitatively high, the presence of Ph students is still quantitatively low. The number of PhD students has increased in the period under evaluation but is still rather low in comparison to the number of staff members with HDR.

The projects of the unit for the next future seem to be guaranteed taking into account the qualified and multidisciplinary scientific expertise available in the unit and the choice of nutrition, metabolism, physical activity as research fields which allow developments towards basic science as well as towards applications and translation science. However, a more detailed analysis casts some doubts as the potential of the unit risks to get lost in a multiplicity of research lines without a clear focus on few selected axes.

The turnover of the staff related to aging and retirement might represent a further problem and, finally, the organization in two teams, which reflects the history of the unit and the presence of specific expertise, is presently an important feature of the unit but can be seen in the future as a weak point instead of a strength.

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2 rue Albert Einstein 75013 Paris, France T. 33 (0)1 55 55 60 10



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