

**FINAL RESUME ON THE RESEARCH UNIT:**  
Genetics, Physiology and Livestock Systems  
(GenPhySE)

**UNDER THE SUPERVISION OF THE  
FOLLOWING INSTITUTIONS AND  
RESEARCH BODIES:**

Institut National de la Recherche Agronomique -  
INRA

Institut National Polytechnique de Toulouse - INP  
Toulouse

École Nationale Vétérinaire de Toulouse

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**EVALUATION CAMPAIGN 2019-2020**  
GROUP A



In the name of Hcéres<sup>1</sup>:

Nelly Dupin, Acting  
President

In the name of the experts committee<sup>2</sup>:

Marie-Pierre Ellies-Oury, Chairwoman of the  
committee

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

<sup>1</sup> The president of Hcéres "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 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

<b>Unit name:</b>	Genetics, Physiology and Livestock Systems
<b>Unit acronym:</b>	GenPhySE
<b>Current label and N°:</b>	UMR_A_1388
<b>ID RNSR:</b>	201421780T
<b>Application type:</b>	Renewal
<b>Head of the unit (2019-2020):</b>	Ms Juliette RIQUET
<b>Project leader (2021-2025):</b>	Ms Juliette RIQUET
<b>Number of teams and/or themes:</b>	10

## EXPERTS COMMITTEE MEMBERS

<b>Chair:</b>	Ms Marie-Pierre ELLIES-OURY, Bordeaux Sciences Agro
<b>Experts:</b>	Ms Joëlle AMSELEM, Inra - Centre de Versailles Grignon (supporting personnel) Mr Jérôme BINDELLE, Université de Liège, Belgique Mr Christophe BRESSAC, Université François-Rabelais de Tours (representative of CNU and CNECA) Mr Tom DRUET, Fonds National de la Recherche Scientifique, Liège, Belgique Mr Éric Jenczewski, Inra - Centre de Versailles Grignon (representative of Inra CSS)

## HCÉRES REPRESENTATIVE

Mr Jean-François HOCQUETTE

## REPRESENTATIVES OF SUPERVISING INSTITUTIONS AND BODIES

Ms Catherine COLIN, INP Toulouse  
Ms Françoise MEDALE, Inra, PHASE Division  
Ms Edwige QUILLET, Inra, Animal Genetic Division  
M Pierre SANS, ENVT

## INTRODUCTION

### HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

The GenPhySE Unit was created in 2014 by merging 3 laboratories: the UR0631 SAGA « Station d'Amélioration Génétique des animaux », the UMR444 LGC « Laboratoire de Génétique Cellulaire » and the UMR1289 TANDEM « Tissus Animaux, Nutrition, Digestion, Ecosystèmes et Métabolisme ». The fusion project was launched so that the unit could be more visible at the local, national and international level.

The GenPhySE Unit is a Joint Research Unit between INRA, the "Institut National Polytechnique de Toulouse, INPT" and the "Ecole Nationale Vétérinaire de Toulouse, ENVT". GenPhySE agents are located on five different sites in Toulouse area.

The Unit is positioned among the major features of the GA "Génétique Animale" and the PHASE "Physiologie Animale et Systèmes d'Élevage" division of Inra. More precisely, the Unit includes 104 agents from the Animal Genetic division and 21 agents from the Phase division (for a total of 147 permanent agents). GenPhySE is organised in 10 research teams, 1 support teams and 5 platforms.

### MANAGEMENT TEAM

At its creation and until August 31th, 2018, the Unit was managed by Xavier Fernandez. Since September 1<sup>st</sup>, 2019, the Unit is managed by Juliette Riquet. She is assisted by two deputy directors: Sylvie Combes and Martine Bouissou-Matet Yerle.

### HCÉRES NOMENCLATURE

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### THEMATICS

Research at GenPhySE aims at understanding the genetic underpinnings and physiological processes underlying livestock phenotypes, including when considering animals in their production systems. The main objectives are to 1) improve knowledge on the structure and functional organisation of genomes, 2) explore genetic variability of complex traits in livestock, 3) understand the biological mechanisms underlying the elaboration of phenotypes, 4) increase genetic gain through genomic selection and breeding programs designing, 5) understand environmental effects on phenotypes, and 6) design more sustainable livestock production systems. That for, the Unit works on various animal models. The disciplines covered by the Unit are related to genetics (cytogenetics, population genetics, quantitative genetics, statistical genetics), modelling (selection modelling, character modelling and genetics), molecular and cellular biology, animal science (physiology, nutrition), bioinformatics, mathematics and statistics.

## UNIT WORKFORCE

<b>GenPhySE</b>		
<b>Active staff</b>	<b>Number 06/30/2019</b>	<b>Number 01/01/2021</b>
Full professors and similar positions	4	4
Assistant professors and similar positions	6	7
Full time research directors (Directeurs de recherche) and similar positions	16	16
Full time research associates (Chargés de recherche) and similar positions	23	24
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)	96	101
<b>Permanent staff</b>	<b>145</b>	<b>152</b>
Non-permanent professors and associate professors, including emeritus	0	
Non-permanent full time scientists, including emeritus, post-docs (except PhD students)	2	
PhD Students	26	
Non-permanent supporting personnel	30	
<b>Non-permanent staff</b>	<b>58</b>	
<b>Total</b>	<b>203</b>	<b>152</b>

## GLOBAL ASSESSMENT OF THE UNIT

GenPhySE is one of the two biggest units of the INRA's GA division. It was created five years ago and is at the end of the transition period that has accompanied the reorganisation of the different founder units in different teams. The outcome is positive. Project partnerships and publication authorships demonstrate the strong interactions that have emerged/strengthened within GenPhySE. The Unit has also met one of the strategic goal behind its creation since it has increased its visibility and influence as evidenced by the coordination and contribution to many European projects and COST actions.

GenPhySE meets the dual objectives of INRA: producing high quality science, with a strong emphasis to translate this knowledge into concrete applications. The scientific production is rich, of high quality and internationally recognized. The relationship with the industry is strong and has been built on a long-term basis.

The unit is also tightly linked to higher education via the "Ecole Nationale Supérieure Agronomique" (ENSAT), the "Ecole Supérieure d'Ingénieurs de Purpan" (EIP) and the "Ecole Nationale Vétérinaire de Toulouse" (ENVT).

GenPhySE has very good infrastructure with platforms and cross-functional teams (Chromosomal analysis of livestock population's platform, experimental facility, Computing and automation team) that span a wide range of activities (clinical cytogenetics, experimental facilities, Bio-informatics and informatics). The unit has also very strong link with other platforms (GeT-PlaGe and SIGENAE) and joined a Convergence Lab (on digital agriculture) that together provide cutting-edge technologies and tools. Moreover, the unit has a good strategy for assigning positions on different platforms with which it collaborates very closely. This strategy is permitted by a pro-active approach of Unit's members (e.g., targeting new congresses).

Compared to other units, GenPhySE develops original programs on epigenetics, structural and functional cytogenetics and bio-informatics to understand the variability of genome structure.

GenPhySE implements multi-disciplinary projects that bring together molecular and quantitative geneticists, nutrition physiologists and experts in breeding systems.

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

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