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## PhD opportunity - Functional characterization of a microprotein at the crossroads of metabolism, interorgan communication and organismal physiology

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This PhD opportunity is offered through the [BEST Doctoral Programme](#), led by the **University of Toulouse** and co-funded by the **European Union** through **Horizon Europe – Marie Skłodowska-Curie Actions (MSCA COFUND)** and the **Toulouse Initiative for Research's Impact on Society (TIRIS)**. Thanks to this programme, **19 doctoral candidates** will be recruited through an international co-supervision scheme across three major TIRIS thematic pillars : Health & Well-being, Global Changes and Sustainable Transitions. The entire recruitment process will take place between November 2026 and April 2027 and will be managed by the **University of Toulouse (UT)**.

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|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Host Institution</b>                                                         | <a href="#">Center for Integrative Biology (CBI), Centre National de la Recherche Scientifique, University of Toulouse, France</a> |
| <b>Supervisor</b>                                                               | Jennifer Zanet, <a href="#">SmORFs and Microproteins in Drosophila team</a>                                                        |
| <b>Co-supervising institution</b>                                               | Centre for Organismal Studies (COS), Heidelberg, Germany                                                                           |
| <b>Co-supervisor</b>                                                            | Gilles Storelli                                                                                                                    |
| <b>Contract duration:</b> 36-month <b>Starting date:</b> September/October 2027 |                                                                                                                                    |

### Research topic

Microproteins are small proteins (under 100 amino acids) translated from small open reading frames (smORFs). They were long overlooked due to their small size and presumed non-coding nature. The recent discovery of thousands of smORFs and candidate microproteins across all domains of life points to a vast, previously unrecognized class of biological regulators with significant roles in systemic physiology. Both of our teams use the model invertebrate *Drosophila* and its unmatched genetic resources for research. Our group in Toulouse is a pioneer in exploring the *Drosophila* microproteome and characterizing novel regulatory microproteins at the molecular and physiological levels. The partner lab in Heidelberg studies metabolic and physiological regulation, with a specific focus on the digestive system and its interaction with peripheral tissues. Together, we have discovered that a previously uncharacterized microprotein localizes to lipid droplets and regulates cellular lipid levels. This microprotein appears essential in the small intestine, supporting both fecundity and longevity. Preliminary data from both teams further reveal that it acts in the intestine to regulate the function of distant organs, thereby playing roles in interorgan communication. The goal of this PhD project is to elucidate how this microprotein acts, from the molecular to the organismal level, to coordinate lipid metabolism, intestinal and systemic physiology, with a particular focus on reproduction and aging.

The specific objectives are to: 1. To investigate how the candidate microprotein regulates lipid metabolism at the cellular, tissue, and organismal levels. 2. To identify its molecular interactors and assess its functional conservation in humans. 3. To characterize its role in intestinal physiology and interorgan communication. The PhD candidate will employ multidisciplinary approaches, including *Drosophila* genetics, multi-omics, imaging, metabolic and physiological assays, cell biology, and biochemistry.

Through the complementary expertise of the two host laboratories, this project will establish a comprehensive understanding of how a previously uncharacterized microprotein connects cellular metabolism to interorgan communication and organismal physiology. Beyond characterizing a novel regulator of gut homeostasis, lipid metabolism, fertility and aging, this work will help expand the emerging field of microprotein biology, while equipping the candidate with strong multidisciplinary training across two highly competitive academic environments

**Keywords:** microprotein, lipid droplet, *drosophila*, metabolism, gut physiology, reproduction

## Context

### International Co-supervision

The project will be internationally co-supervised by **Jennifer Zanet from the [SmORFs and Microproteins in \*Drosophila\* team](#) at CBI Toulouse, France (Centre National de la Recherche Scientifique, [University of Toulouse](#))** and **Gilles Storelli at the Centre for Organismal Studies (COS)** in Germany.

The PhD student will conduct their doctoral research between both Zanet's team and Storelli's team, benefiting from the complementary expertise and resources of the two teams. The scientific environments at the CBI in Toulouse and the Centre for Organismal Studies (COS) in Heidelberg provide access to state-of-the-art infrastructure, including advanced equipment, *Drosophila* facilities and imaging platforms, ensuring a research environment to successfully address the objectives of the project

### Experience/Skills required :

- Hold, by 23 November 2026, a Master's degree or an equivalent qualification granting access to doctoral studies in France and not hold a doctoral degree.
- Have not resided in France or carried out your main activity in France for more than 12 months during the 36 months immediately preceding 23 November 2026. Periods of stay as a tourist, refugee, or time spent in national service, are not considered as residency.
- Have a B2 level of English
- We are seeking a curious, motivated and highly enthusiastic candidate with a genuine interest in cell biology and animal physiology.
- The PhD project will involve a wide range of experimental approaches, including *Drosophila* genetics, physiological tests (fertility, feeding, metabolite measurements, etc.), immunostainings, confocal imaging, molecular biology (PCR, cloning), biochemistry (western blot), transcriptomics and metabolomics; prior experience in these areas will be a plus.

## Application Process

**Call for application - 23 November 2026**

Applications must be submitted online through the application platform : [edd-projets.utoulouse.fr](http://edd-projets.utoulouse.fr)

**Please contact us at [isabelle.saves@utoulouse](mailto:isabelle.saves@utoulouse) before applying, or if you have any questions regarding CBI or the recruitment process. Please use the following email subject line: BEST call – [Supervisor name].**

**Eligibility check** - 24 to 30 November 2026

**Written evaluation** - 4 December to 15 January 2027

**Consolidation of pre-selected projects** - 19 January to 19 March 2027

**Oral evaluation** - 29 March to 4 April 2027

**Result** - April 2027

**Starting date:** September/October 2027 (Contract duration: 36 months)

For additional information: <https://doctorat.univ-toulouse.fr/cofund-best>

Contact : [best-helpdesk@utoulouse.fr](mailto:best-helpdesk@utoulouse.fr)

## About the CBI

Located in Toulouse, in the sunny southwestern of France, the [Center for Integrative Biology \(CBI\)](#) is a **fundamental biology research institute** affiliated with the [National Center for Scientific Research \(CNRS\)](#) - the largest public research organization in France - and the University of Toulouse. The institute brings together **47 research groups**.

The CBI aims to understand the mechanisms, dynamics and behaviors of living organisms, to advance knowledge on the current societal challenges. Research at the CBI use multidisciplinary and multi-scale approaches, from isolated molecules to whole organisms and animal societies, applied to numerous model organisms, from bacteria to man.

CBI offers an **international and interdisciplinary research environment**, with access to advanced facilities and opportunities for scientific and career development. The institute benefits from **a collaborative and international scientific culture**, and is committed to promoting equality, diversity and inclusivity.