

**Entity:** Vall d'Hebron Institut de Recerca (VHIR)

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**Research group, Unit or Department:** Laboratory of Metabolism and Obesity/Group of Diabetes and Metabolism

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**Student's tutor:** Dr. Josep A. Villena

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**Positions available:** 2.

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### Project description/ Research lines

The main research lines of our laboratory focus at understanding the molecular mechanisms that control energy homeostasis in the organism, whose alterations are linked to the development of metabolic diseases, such as obesity, type 2 diabetes or metabolic syndrome.

Our lab offers **two positions** to carry the experimental work of the Master's degree in Translational Biomedical Research working on the project entitled "**Molecular basis of calorie restriction**". For decades, it has been appreciated that calorie restriction is the most robust intervention known to extend lifespan in a wide variety of organisms, from yeast to mammals. It also prevents the development of numerous pathologies, including metabolic disorders (i.e. diabetes), neurodegenerative diseases and cancer. Sirt1, a NAD<sup>+</sup>-dependent deacetylase of the sirtuin family, has been identified as one of the major effectors of calorie restriction, but still the exact mechanisms involved in the beneficial effects of calorie restriction remain unknown. In this project, we first aim at uncovering the different pathways and cellular processes regulated by calorie restriction and calorie-restriction mimetics (i.e. resveratrol, SIRT1) by performing a microarray-based gene expression profiling study in adipose tissues of different mouse models. Moreover, we will generate tissue-specific knockout mice for PGC-1 $\alpha$ , PGC-1 $\beta$  and other regulators of mitochondrial biogenesis (ERRs, MTERFs) in order to study their contribution to the effects elicited by calorie restriction on energy metabolism, as well as their impact on glucose homeostasis and healthy aging. Our research efforts are directed to identify new potential therapeutic targets aimed to improve metabolic and degenerative diseases.

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**Period for the internship:** Throughout the duration of the Master

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### Requirements:

We are looking for highly motivated candidates, interested in pursuing a professional career in the field translational research by joining a PhD program in Biomedicine or similar. Candidates must hold a B.S. in

Biology, Biomedicine, Biochemistry or similar. A strong background in molecular and cellular biology, as well as good English speaking and writing skills are also required.

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**Where to apply:** Interested candidates please send a letter of intention, CV and academic records to Dr. Josep A. Villena ([josep.villena@vhir.org](mailto:josep.villena@vhir.org))

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