Universidad de Navarra
Facultad de Ciencias

MÁSTER EN INVESTIGACIÓN BIOMÉDICA
Research Project Proposal
Academic year 2026-2027

Project Nº 39

Title: *Sex-dependent remodeling of brown and perirenal adipose tissue after sleeve gastrectomy in diet-induced obesity*

Department/ Laboratory *Metabolic Research Laboratory, Department of Endocrinology & Nutrition, Clínica Universidad de Navarra*

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Summary
Obesity is a multifactorial disease associated with alterations in adipose tissue function. Bariatric surgery, particularly sleeve gastrectomy (SG), induces metabolic improvements that cannot be fully explained by caloric restriction alone, suggesting the involvement of additional hormonal and metabolic mechanisms, including brown adipose tissue (BAT) activation and browning of white adipose tissue depots. However, mechanistic data, particularly regarding depot-specific and sex-dependent effects of SG are limited. Given established sexual dimorphism in adipose tissue biology, elucidating differential thermogenic and inflammatory remodeling across adipose depots and between sexes may provide insight into SG-specific metabolic adaptations.

Objectives
Characterize BAT activation and perirenal adipose tissue (PRAT) remodeling following SG, and determine sex-dependent differences in thermogenic and inflammatory pathways, distinguishing surgery-specific effects from caloric restriction using pair-fed controls.

Techniques
The following techniques will be used:
Biochemical and hormonal (adipokines) determinations.
Molecular techniques for gene expression analysis:
· RNA isolation from adipose tissue
· Nucleic acid and protein quantification and quality assessment.
· Analysis of gene expression by Real-time PCR.
Molecular techniques for protein expression analysis:
· Protein extraction from adipose tissue.
· Protein quantification: Bradford protein assay.
· Analysis of protein expression by Western-blot.
Immunohistochemical analysis.

yes	
no	X

Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?