



## MÁSTER EN INVESTIGACIÓN BIOMÉDICA

### Research Project Proposal

Academic year 2022-2023

#### Project Nº 44

**Title:** *Modulation of adipokines release by  $\omega$ -3 fatty acids: effects on GLUT12 expression in breast cancer.*

**Department/ Laboratory:** *Dpt. Nutrition, Food Science and Physiology and Nutrition Research Center. Faculty of Pharmacy and Nutrition*

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#### Summary

Breast cancer is the most frequently diagnosed cancer worldwide. Obesity influences breast cancer development and progression, increasing the risk of mortality by 40% in obese patients. Adipose tissue increases in obesity, and breast cancer microenvironment includes adipocyte cells. These cells have been described as suppliers of metabolic substrates that support breast cancer progression and show dysfunctional release of adipokines, hormones that directly modulate progression of tumor cells. On the other hand,  $\omega$ -3 fatty acids exert beneficial actions in obesity through the adipose tissue. Remarkably, it has been described the antitumor effect of  $\omega$ -3 supplementation on tumor cells.

Tumor growth is maintained thanks to the high rate of glucose consumption. Glucose uptake is performed by the GLUT family of transporters. In the tumor cells, this glucose entrance is the rate-limiting process in the tumor development. GLUT12, one of the last members of the GLUT family identified, shows increased expression and activity in breast cancer cells, therefore is a potential target to treat these tumors. Interestingly,  $\omega$ -3 fatty acids supplementation in mice decrease GLUT12 expression in different tissues.

The main goal of this research project is to evaluate if the modification of the adipokine profile induced by  $\omega$ -3 fatty acid-treated adipocytes, influence the main tumor cells through GLUT12 downregulation. The methodology will include the treatment of breast cancer cell lines with conditioned media of adipocytes treated with  $\omega$ -3 fatty acids, as well as a in co-culture systems. Proliferation assays, RT-PCR, Western blot and Immunofluorescence will be used to determine the effect in GLUT12 expression and localization.

yes	
no	x

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