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# Potencial use as breast cancer therapy and mechanism of action of an aptamer against MNK1b

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Breast cancer is the most common type of cancer diagnosed in women and is the leading cause of cancer death in many countries (1). Mitogen-activated protein kinase-interacting kinases (MNKs) are overexpressed in several types of cancer and promote metastasis and tumor progression through the control of the expression of proteins involved in cell cycle, survival and migration (2). In human cells, there are four isoforms of MNKs (MNK1a/b and MNK2a/b) (3) that exert their function through phosphorylation of initiation factor 4E (eIF4E) and other substrates (sprouty, PSF, hnRNP1) (4,5,6). Aptamers are single chain nucleic acids (ssDNA and RNA) isolated from oligonucleotide libraries by in vitro selection by exponential enrichment in the presence of the ligand (SELEX). Aptamers adopt three-dimensional structures that allow them to bind in a stable and highly specific way to their targets, which gives them a high potential as therapeutic and diagnostic tools (7,8). We have obtained, optimized and characterized a highly specific aptamer against MNK1a/b, with a dissociation constant in the nanomolar range, which produces significant inhibition of proliferation, colony formation, migration, and invasion in breast cancer cells. At the molecular level, apMNKQ2 modulates the levels of MNK1a/b, anti-apoptotic proteins and EMT related proteins. In murine orthotopic model of triple-negative breast cancer, apMNKQ2 reduces tumor volume and the number of metastases. In conclusion, apMNKQ2 could be used as an anti-tumor drug in the future. (Up to 250 words)

## Biography

Raquel Ferreras Martín has a degree in Biochemistry and a Master's degree in Neuroscience from the Complutense University of Madrid. Between 2015 and 2017 she began her research activity in the Neurovascular Research Unit at the UCM as an undergraduate student. In 2018 she joined the Aptamers laboratory at the Instituto Ramón y Cajal de Investigación Sanitaria as a PhD student with a highly competitive fellowship to study of the mechanism of action of apMNKQ2 as an antitumor drug in breast cancer. Some of the results of her research have been published in 2 congresses, 2 papers and 1 review (Up to 100 words)