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Apelin-13 inhibits the antiproliferative AMP-activated kinase in MCF-7 breast cancer cell line

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Breast cancer is considered the leading cause of death for women worldwide. Currently, the characterization of biomarkers for subtypes of breast cancer is an urgent requirement that makes it possible to better optimize the consensus of diagnosis and treatment of this disease in more homogeneous subgroups. Pre-clinical exploratory studies to identify potential candidates as tumor biomarkers are considered the first step to refine the research of such molecules. Many members of the G protein-coupled receptors family (GPCRs) are known for their implication in breast cancer progression and metastasis. In our study, we aim to verify the role of intracellular signaling induced by Apelin peptide jejunum (APJ), a GPCR, as a new modulator of growth signaling in the breast cancer cell line, MCF-7. We confirmed for the first time the constitutive expression of the APJ receptor in MCF-7 by two different techniques, immunocytochemistry, and confocal microscopy. Also, we explored the effect of APJ activation by its specific ligand, apelin-13, on the AMP-activated protein kinase (AMPK), which is known in the literature for its antiproliferative effect on MCF-7 cell line. MCF-7 cells were treated for 5, 10, 20, 30 or 60 minutes with 100 nM apelin-13, in the presence or the absence of 1 nM estrogen. We verified by immunoblotting that apelin-13 decreases the constitutive AMPK activity in a time-dependent manner. Our results confirm that, the activation of APJ in MCF-7 by apelin-13 and suggest a proliferative role of this hormone, at least by the abrogation of the AMPK signaling pathway. Our study will provide a new trail in the understanding of the molecular mechanisms involved in breast carcinogenesis, a prerequisite for the development of targeted therapies against this complex disease.

Biography

Rim Bouchelaghem is pursuing her PhD in Biochemistry and Environmental Toxicology Laboratory at University Badji Mokhtar in Annaba (UBMA), Algeria. Her research concentrates on the discovery of biomarkers in breast cancer. She has completed her Doctoral degree in Medicine from UBMA, and her MSc degree in Immunology from University de Sherbrooke (UdeS), Canada. She is working on Molecular Analysis at the anatomo-pathology section of the Anti-Cancer Center (CAC) Abdelaziz Al Saoud of Annaba.

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