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Effects of melatonin on chemotherapy treatments in gene expression and proteomics of human breast cancer cells

Javier Menéndez Menéndez, Carlos Martínez Campa, Carolina Alonso González, Alicia González, Alicia González González and Samuel Cos
University of Cantabria, Spain

Melatonin is the main secretory product of the pineal gland. It is an oncostatic agent that reduces the growth and development of various types of tumors, particularly those whose growth is dependent on estrogen. Data from nearly 500 articles published in the last 20 years, call attention to the hypothesis that melatonin interacts with estrogen signaling pathways at three different levels: 1) Acting as a selective estrogen receptor modulator (SERM), obstructing the activation of estradiol receptors, and consequently, down regulating the expression of proto- oncogenes, growth factors and genes involved in process like proliferation, invasiveness and metastasis. 2) Acting as a selective modulator of the enzymes involved in the synthesis of steroid hormones (SEEM), inhibiting the expression of some enzymes (aromatase and sulfatase estrogen) and stimulating others (estrogen sulfotransferase). 3) Interfering with the hypothalamus-pituitary-reproductive axis in such way that the synthesis of estrogens is decreased. Correspondingly to the properties mentioned, melatonin might be a very good adjuvant for chemotherapy treatments currently used in cancer. However, little is known about the consequences that melatonin might have over the molecular changes induced by chemotherapy agents at the tumor cell level. In this work, as an experimental approach, we cotreated an estrogen receptor positive cell line derived from a mammary adenocarcinoma (MCF-7 cells) with chemotherapy agents and the pineal hormone, in order to investigate whether melatonin can modulate the gene expression and the proteomic changes induced by the chemotherapy agents.

Biography

Javier Menéndez Menéndez is a young researcher in Molecular Biology and Biomedicine who is completing his PhD from Cantabria University. He is investigating about breast cancer and the sensitizing effects of melatonin in chemotherapy and radiotherapy since 2014. He has published five papers in reputed journals as well as a book chapter. Also, he has presented his works in two national congresses.

javier.menendezm@alumnos.unican.es

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