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The endocannabinoid system: Bone to breast therapeutic potential

Reza Mehdizadeh
Iranian Breast Cancer Research Center, Iran

The endocannabinoid system consist of cannabinoid CB1 and CB2 receptors, endogenous ligands and the enzymes and processes responsible for the biosynthesis, cellular uptakeor metabolism of these "endocannabinoid" ligands. A wide range of studies were designed to reveal how cannabinoids affects our cell environment: from bone to cancer cells. Endocannabinoid system (ES) as a regulator of bone remodeling, presents novel therapeutic strategies for prevention and treatment of bone disorders. For instance, studies revealed that cannabinoid treatment reduces breast cancer-induced bone loss, fracture, and pain. ES provides an ideal source for cell transplantation or tissue engineering therapies through the positive impact on the survival of differentiated mesenchymal stromal cells (MSCs). Furthermore, Cannabinoid signalingis connected with inhibition of cancer cell proliferation, migration, tumor angiogenesis, and induction of apoptosis through inhibition of p27/KIP1. In contrast, promotion of anti-apoptotic effects and regulation of anti-tumor immune response may induce tumor growth. Some studies indicated that the system's agonists are effective to regulate breast cancer proliferation, invasion, and migration. On the other side, some evidences showed that in the absence or low-concentrated cannabinoid receptors in tissues, the administration of synthetic and/or phytocannabinoids may increases incident of cancers. We need to determine the balance between these diverse mechanisms, and how they modulate cancer *in vivo*. In conclusion, the endocannabinoid system is an exciting target for research on the treatment of cancers, especially triple negative breast cancer which has poor prognosis without any standard targeted therapy. By further clinical trials and modern genome engineering methods, cannabinoid system has a great potential for studying therapeutic options in the future.

Biography

Reza Mehdizadeh received his MSc (2011) in Cell and Molecular Biology from University of Tehran, Iran. He is a researcher at Iranian Breast Cancer Research Center and Ronak Pharmaceutical Company. He is workingon many projects in coordination with cancer National Institute of Genetic Engineering and Biotechnology about molecular targeted therapy especially on triple negative breast cancer. He studied receptor tyrosine kinases (RTKs) and followed their signaling pathways in tumors.

mehdizadeh@alumni.ut.ac.ir

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