Review Article

Review on the molecular signaling pathways involved in controlling cancer stem cells and treatment

F. Forouzesh¹, N. Agharezaee¹

¹Department of Genetics, Tehran Medical Sciences Branch Islamic Azad University, Tehran, Iran

Corresponding Address: Flora Forouzesh, Tehran, Dr. Sharyati Street, Shahid Khaghani Street, Department of Genetics, Medical Sciences Branch of Islamic Azad University, Tehran, Iran
Tel: +98-21-22006660-7, Email: f8forouzesh@gmail.com
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★Abstract★

In recent years, knowledge of the biology of stem cell has been very effective and the precise and proper regulation of stem cell function are important for their bio-activity. Several main signaling pathways have roles in regulating them including Wnt/β-catenin, and Hedgehog which mediate different stem cell properties including self-renewal, survival, proliferation, and differentiation. Also, molecular structures such as microRNAs act as tumor inhibitors or oncogenes and will change the direction of the messenger. The purpose of this review is to find and introduce different signaling pathways involved in controlling cancer stem cells with cancer treatment goals. The search was conducted using several databases including Google Scholar, PubMed, Scopus, Science Direct and totally 93 papers were selected. It seems that very important signaling pathways have been disturbed in cancers and excessive or abnormal signaling through these pathways can contribute to the survival of stem cells. Many of these pathways are not direct, but as an interconnected network of signaling could feed each other. Better therapeutic goals can be achieved with understanding signaling pathways involved in cancer stem cells and drug resistance.

Keywords: Cancer stem cell, MicroRNAs, Molecular signaling pathways, Cancer therapy