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MiR-139-5p reverses stemness maintenance and metastasis of colon cancer stem-like cells by targeting E2-2

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Colon cancer is considered to be the third largest cancer in the world and is one of the most common malignancies worldwide. Surgery combined with chemotherapy is the main treatment for colon cancer. Although the survival rate has been improved with the advancement of surgical techniques, tumor metastasis and recurrence still bring poor prognosis to patients. Colon cancer stem cells (CCSCs) refer to cancer cells with stem cell properties, that is, the ability of self-replication and multi-lineage differentiation. Approximately 90% of colon cancers are associated with aberrant activation of the Wnt signaling, and abnormal Wnt signaling plays an important role in maintaining the stemness of cancer stem cells (CSCs). We have previously reported miR-139-5p, an important tumor suppressor, decreases in the clinical colon cancer samples as the tumor malignancy increases. The purpose of this study is to provide a theoretical basis for the clinical diagnosis and treatment of recurrent or metastatic colon cancer with miR-139-5p. We sorted CD133+/CD44+ HCT116 and HT-29 by flow cytometer. They are called colon cancer stem-like cells (CSLCs). Experiments showed that both double positive cells presented a strongly activated Wnt signaling. We found that miR-139-5p targets the Wnt/β-catenin downstream effector E2-2 in CSLCs. Meanwhile, E2-2 is a pivot molecule in the negative feedback loop of miR-139-5p/β-catenin/TCF7L2. Its small interfering RNA reverses the stemness maintenance and epithelial-mesenchymal transition (EMT) of CSLCs. *In vitro* and *in vivo* methods combined with clinical samples suggest that E2-2 can be an indicator of the stemness characteristics of colon cancer stem-like cells.

Recent Publications

1. Weiwei C, Xiaoying M, Xin L and Jianwen L (2017) MiR-212-3p inhibits LPS-induced inflammatory response through targeting. Exp Cell Res 350(2):318-326.
2. Xin L, Jingjing W, Weiwei C, Xiaoying M and Jianwen L (2017) Inhibition of airway remodeling and inflammation by isoforskolin in PDGF induced rat ASMCs and OVA-induced rat asthma model. Biomed Pharmocother 95:275-286.
3. Yueqi L, Yiyang C, Cen Q, Xiaoying M, Xin L and Jianwen L (2019) 17-allylamino-17-demethoxygeldanamycin impeded chemotherapy through antioxidant activation via reducing reactive oxygen species-induced cell death. J Cell Biochem 120:1560-1576.

Biography

Xiaoying Ma is pursuing her Doctoral degree in Pharmacy in the School of Pharmacy at East China University of Science and Technology. Her current research interests include the study of the mechanism of microRNAs regulating drug target proteins and explore their application in the development of new anticancer drugs based on the methods of cancer stem cell (CSC) sorting. A research model was established to elucidate the mechanism of microRNAs regulation of CSC-driven multidrug resistance and metastasis; preclinical studies of mesenchymal stem cells in the treatment of colon cancer.

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