Do you want to know another role of ribonucleotide reductase M2?

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Ribonucleotide reductase (RR) is a target metabolic enzymes for cancer therapy. Few studies have described the correlation between RRM2 and the development of colorectal cancer. And the possible mechanism by which RRM2 mediates colorectal cancer progression is unclear. It is well established that in some types of cancer, elevated RRM2 levels correlate with chemoresistance, but whether it may contribute to the response to ultraviolet irradiation is unclear.

Colorectal cancer (CRC) is the leading cause of cancer-related death worldwide. In addition, the incidence and mortality rates of colorectal cancer are on the rise. Recently, metabolic genes have received increasing and specific attention due to their potential role in carcinogenesis.

Previous studies have shown that alterations in ribonucleotide reductase (RR) levels may significantly influence the biological properties of cells, including tumor promotion and tumor progression, suggesting that RR may be implicated in tumorigenesis. Recent findings have established that p53R2 suppresses the invasiveness of cancer cells, and its expression is associated with a better survival prognosis for CRC patients; however, the function of RRM2 in CRC is unclear. Here, we demonstrate that RRM2 may play an important role in the development of CRC and may contribute to the response to UV irradiation.

A research article to be published on September 14, 2012 in the World Journal of Gastroenterology addresses this question. The research team

led by Prof. Lu from Shanghai Minimally Invasive Surgery Center (Ruijin Hospital, Shanghai Jiaotong University School of Medicine) from China investigated the roles of the hRRM2 subunit in colorectal cancer and UV-induced DNA damage repair.

The results showed that RRM2 overexpression was positively correlated with invasion depth, poorly differentiated type, and tumor, node, metastasis stage. The expression of RRM2 in HCT116 cells was down-regulated after transfection, and HCT116 cell proliferation was obviously suppressed. In the invasion test, the number of cells that passed through the chambers in the RRM2-siRNA group was lower than that in the negative control groups. The results suggest that RRM2 overexpression may be associated with colorectal cancer progression. RRM2 silencing by siRNA may inhibit the hyperplasia and invasiveness of colorectal cancer cells, suggesting that RRM2 may play an important role in the infiltration and metastasis of colorectal cancer, which is a potential therapeutic strategy in colorectal cancer. In addition, RRM2 depletion increased UV sensitivity.

The researchers drew a conclusion that RRM2 may be a facilitating factor in colorectal tumorigenesis and UV-induced DNA damage repair.

Their study suggests that RRM2 silencing may inhibit the hyperplasia and invasiveness of colorectal cancer cells. RRM2 may play an important role in the infiltration and metastasis of colorectal cancer and that suppression of its function could be a potential therapeutic strategy in colorectal cancer.

More information: Lu AG, Feng H, Wang PXZ, Han DP, Chen XH, Zheng MH. Emerging roles of the ribonucleotide reductase M2 in colorectal cancer and UV-induced DNA damage repair. World J Gastroenterol 2012; 18(14): 4707-4713

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