Overexpression of miR-148a Enhances the Response of Colorectal Cancer Cells to Irradiation

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Radiotherapy is one of the most important methods for the treatment of rectal cancer patients. Identifying potential factors for predicting the efficacy of radiotherapy in rectal cancer patients is imperative. Based on our clinical results, elevated circulating miR-148a was significantly correlated with the favorable response to radiotherapy. However, the regulative role of miR-148a in radiosensitivity is not yet to be elucidated. We used *in vitro* model to evaluate the effect of miR-148a in the cellular function of colorectal cancer (CRC) cell line (HT-29 cells) after irradiation. MTT assay and colony formation showed that overexpression of miR-148a enhanced the inhibitory effect of irradiation on the viability and proliferation of HT-29 cells. Through flow-cytometry, combined miR-148a and irradiation resulted in sub G1 increase and G2/M phase arrest as well as on the increasing apoptotic cell death. Subsequently, western blotting demonstrated that miR-148a enhanced the irradiation induced downregulation of c-met, the target gene by miR-148a and the regulator of radiosensitivity, pERK, and pAKT in HT29 cells. Therefore, these results suggested that miR-148a enhanced the response of irradiation on the inhibiting proliferation and increasing apoptotic cell death via decreasing the protein level of c-met, pERK, and pAKT. The current study presented that miR148a can be a potential candidate biomarker of predicting efficacy of the radiation in a neoadjuvant treatment in rectal cancer patients.