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miR-3120-5p promotes colon cancer stem cell stemness and invasiveness through targeting Axin2

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Abstract

It is well known that colon cancer stemness and invasiveness are the main reasons for tumor recurrence and metastasis. MicroRNAs dysregulation can disrupt the balance of cell signaling and growth processes, resulting in cancer proliferation, invasion and metastasis, chemoresistance and so on. In this study, we used colon cancer cell lines HCT-116 and SW-480 to investigate the effects of miR-3120-5p on stemness and invasiveness of colon cancer. We found that the population of CD133⁺ and Lgr5⁺ stem cells in both cell lines expressed miR-3120-5p highly, and introducing miR-3120-5p into both cell lines increased the population of cancer stem cells, as measured by flow cytometry, qRT-PCR and sphere formation assays. Transwell assay, Gelatin zymography assay and Western blot assays further revealed that miR-3120-5p promotes colon cancer cells invasive ability. By the target prediction algorithm TargetScan, we found Axin2 is a potential target for miR-3120-5p, and luciferase reporter assay demonstrated that miR-3120-5p reduces Axin2 expression. Transfection of siRNA against Axin2 into colon cancer cells promoted the stemness and invasion of colon cancer cells. Furthermore, Axin2 overexpression partially reversed the promotion of stemness and invasiveness caused by miR-3120-5p in colon cancer cells. Together, all the results demonstrated miR-3120-5p promotes stemness and invasiveness of colon cancer cells through direct targeting of Axin2. They suggest that antago-miR-3120-5p plays important roles on treatment strategy for colon cancer.

Keywords: MiR-3120-5p; colon cancer cells; stemness; invasion

1. Introduction

Colorectal cancer (CRC) is among the three leading causes of cancer-related deaths worldwide[1], and even though several antibodies/molecules have been developed for treating colon cancer, surgical removal and chemo/radiation therapy remains standard of care[2]. Moreover, colon cancer patients often develop metastatic disease or recur

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