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Long non-coding RNA LUCAT1 promotes proliferation and invasion in gastric cancer by regulating miR-134-5p/YWHAZ axis

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ABSTRACT

Purpose: The aim of this study was to research the function of lncRNA LUCAT1 in gastric cancer.
Methods: Human gastric cancer tissues and paracancer tissues were obtained from 98 patients undergoing surgical resection in our hospital. The human gastric cancer cell lines (HGC27, BGC823, MGC803, SGC7901 and AGS), and normal gastric mucosal cell line GSE1 were used to research the role of lncRNA LUCAT1. ShRNAs specifically targeting lncRNA LUCAT1, miR-134-5p mimic, miR-134-5p inhibitor and their related controls were transfected into cells. Quantitative real-time PCR was used to detect the expression of lncRNA LUCAT1, miR-134-5p and YWHAZ. The cell proliferation of SGC7901 cells was determined by CCK8 kit. Colony formation assay was undertaken. Cell apoptosis assay was processed using the Annexin V-FITC / propidium iodide (annxinV/PI) apoptosis detection kit. Migration and invasion were detected by transwell assay. Tumor xenograft model was conducted to calculate the size and weight of the tumors. Luciferase reporter assay was used to confirm the interactions among lncRNA LUCAT1, miR-134-5p and YWHAZ.
Results: LncRNA LUCAT1 was confirmed to be highly expressed in gastric cancer. Patients with high LUCAT1 level displayed short overall survival and disease-free survival periods. LUCAT1 knockdown or miR-134-5p overexpression decreased the proliferation, colony formation, migration and invasion of SGC7901 cells.
Conclusions: LncRNA LUCAT1 could promote proliferation and invasion of gastric cancer by regulating miR-134-5p/YWHAZ axis.

1. Introduction

Gastric cancer is one of the most common digestive tract tumors, which seriously threatens human life and health [1]. In recent decades, with the formation of good eating habits and the eradication of Helicobacter pylori, the incidence of gastric cancer has declined overall [2]. However, the mortality of this disease still ranks the third worldwide, especially in male [3]. According to the China Cancer Data Report (2015), China's new cases of gastric cancer and deaths account for 42.6% and 45.0% of the world [4]. So far, surgery is still the main means of treating gastric cancer [5]. Besides, Chemotherapy is an important strategy for the comprehensive treatment of advanced gastric cancer [6]. As adjunctive therapy after tumor resection, chemotherapy can help control the metastasis and prolong the survival [7]. More importantly, chemotherapy is expected to relieve symptoms [8]. However, due to the lack of specific symptoms in early gastric cancer, most cases of clinical diagnosis in China are in the advanced stage, and the 5-year overall survival rate is 30%–50% [9].

With the deepening of the research on the molecular mechanism of biological behaviors of malignant tumors, various new therapeutic methods are emerging. Among them, "targeted therapy", which is specifically targeted for tumor cell development, cell cycle regulation, apoptosis induction and angiogenesis, is the best known [10]. We have noticed that there were several targets for molecular therapeutics in the treatment of gastric cancer, while the exact value remains to be confirmed in a large-scale phase III clinical study [11]. At the same time,

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