

## miR-129-5p Plays an Anticancer Role in Colon Cancer by Targeting RSF1

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### ABSTRACT

This study aimed to investigate the inhibitory effect of miR-129-5p on colon cancer by targeting RSF1. For this purpose, real-time quantitative PCR was used to analyze whether the expression of miR-129-5p in colon cancer and adjacent normal tissues had an impact on the proliferation and apoptosis of cancer cells (CC). We evaluated the role of miR-129-5p by targeting RSF1 in colon cancer tissue in the experimental group. But in the control group, only miR-129-5p was considered as a protective factor. Finally, we retrospectively analyzed data of 56 cases of colon cancer patients admitted to our clinical department between January 2019 and December 2019. Twenty-eight cases were investigated through just miR-129-5p protective factors for cancer (group A). The other 28 cases were studied by miR-129-5p anti-cancer agent and a completed RSF1 carcinoma factors for cancer (group B). We evaluated the comparative analysis of the patient's age and gender, clinical indicators (including for the first time of hospitalization and postoperative hospital stay, three times of anal exhaust), and complications (including chills, vomiting, hypertension, diabetes). The results showed that miR-129-5p had a more substantial effect on the proliferation and apoptosis of CC by targeting RSF1.

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### Introduction

One of the most common cancers is colon cancer, which affects about one in 10,000 people worldwide each year (1). It is necessary to carry out the cancer-related analysis, in order to help patients in the early pathological changes and treatment in time, to promote the healthy development of the human contribution to boosting the power, and to strive for the early realization of the health situation (2). Even the advanced medical technology at the same time, under the condition of cancer patients is no longer just treated by surgery or chemotherapy, targeted therapy is one of the rises in recent years, cancer treatment, miR-129-5p can be targeted by a variety of molecules play a role of tumor suppressor in various cancers, it is necessary to study whether the miR-129-5p can be targeted by a completed RSF1 suppressor role into full play (3).

For colon cancer research has been a lot of, foreign scholars think that increased the risk of colon cancer in recent years, combined with a massive census data show that colon cancer, in general, is common among the elderly, and colon cancer has a

family tendency, after curing of patients with colon cancer early (4, 5). Domestic scholars mainly study the treatment of colon cancer gene detection and diagnosis problems, due to the early stage of the colon cancer is not special obvious symptoms, you need to through genetic method to detect and diagnose whether suffering from colon cancer, so as to avoid late colon cancer pain of torture, also studied the role of miR-129-5p anti-cancer agent mechanism (6). The research focuses at home and abroad are different, but all of them have provided certain theoretical and research bases for the study in this paper. The only deficiency is that domestic and foreign studies have not explored whether miR-129-5p plays an anti-cancer role in colon cancer by targeting RSF1. Therefore, the study in this paper has certain practical significance and feasibility (7, 8).

In this paper, based on existing studies, the expression of miR-129-5p was tested and related comparative studies were conducted.

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## Materials and methods

### Study Population

In this study, the existing data were mainly used to set up two groups of the control group and experimental group for the study. Clinical data of 56 colon cancer patients admitted to our department from January 2019 to December 2019 were selected as the sample data for comparative analysis. Among them, 28 patients were treated with miR-129-5p anti-cancer factor only (Group A), and the other 28 patients were treated with miR-129-5p anti-cancer factor and RSF1 pro-cancer factor (i.e. Group B). Age and gender, clinical indicators (including time out of bed for the first time, time of anal exhaust and postoperative hospital stay), and incidence of complications (including chills, vomiting, hypertension and diabetes) were compared and analyzed, and data were recorded.

### Real-time Quantitative PCR Analysis

In addition to the experimental specimens, the following reagents were required: Deme-F12 medium, miR-129-5p Mimics, reverse transcription reagents, RNA extraction reagents, double-stained cell apoptosis detection reagents and double-luciferase detection reagents. Second RNA extraction, reverse transcription and fluorescence quantitative PCR, mainly according to the related extraction (namely TRIzol method) to extract the colon cancer cell lines and normal tissue adjacent to carcinoma cell lines of total RNA, retroviruses and reverse transcription reagent, reflect setting time for 2 minutes, reaction temperature of 98 degrees Celsius; Finally, double-cell apoptosis detection reagent was used in colon cancer cell lines and normal adjacent tissue cell lines, and relevant records were made for future studies. The contrastive study in this paper was divided into two groups. The first group was based on real-time quantitative PCR analysis, and the second group was based on clinical data. The following is the experimental process of the two groups of comparative studies:

The first set of comparative study, the experimental group in the miR-129-5p in colon cancer tissue anti-cancer factor as well as a completed RSF1 promote cancer factor, is in the control group in colon cancer tissues only miR-129-5p an anti-cancer factor, which variable is whether

have completed RSF1 carcinoma factors, other factors besides variables and test the cancer cell proliferation apoptosis process steps also remain the same.

Secondly, 10% fetal bovine serum DEME was reused to culture colon cancer cell lines containing RSF1 oncogenic factor (in the experimental group), and the culture time was 48 hours. Then in colon cancer cell lines contain a completed RSF1 promote cancer factor of RNA extraction, reverse transcription and fluorescence quantitative PCR, according to the TRIzol method of extraction of total RNA in colon cancer cell lines, and using retroviruses retrovirus reagent, reflect setting time for 2 minutes, the reaction temperature is 98 degrees Celsius; Following cell transfection and all cultures were replaced 48 hours later.

If expressed in miR-129-5p same amount under the condition of the other two indexes showed the differences, in under the action of a completed RSF1 promote cancer factor, cancer cell proliferation and apoptosis, there is an obvious change in part how miR-129-5p by targeting a completed RSF1 can inhibit cancer cell proliferation, promote apoptosis of CC.

The first set of contrast research for the second group comparison study laid a certain foundation, therefore the second group of study through the clinical data of miR-129-5p judged by targeting a completed RSF1 role in colon cancer, the second group of research objects is admitted to our department in the contrastive study of the clinical data of 56 patients with colon cancer, time range in January 2019 to December 2019.

First, the experimental group and control group of the second comparison study were determined, in which the control group was group A (including 28 patients who received anti-cancer treatment only by miR-129-5p anti-cancer factor), and the experimental group was group B (including 28 patients who received anti-cancer treatment by miR-129-5p anti-cancer factor and RSF1 pro-cancer factor). Among them, the variable is whether there is an RSF1 oncogenic factor, and other factors other than the variable remain unchanged.

**Statistical Analysis**

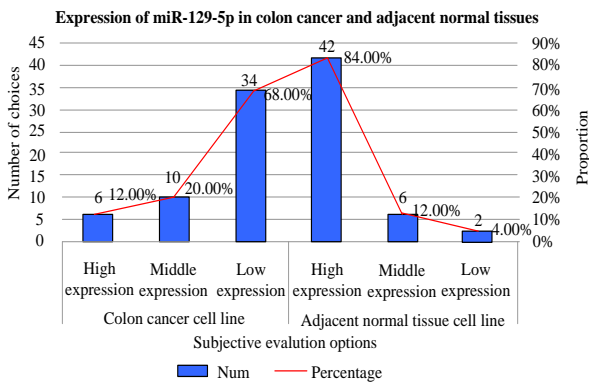
SPSS was used to analyze the clinical data of the patients. Using T-test analysis of patient's age and gender, clinical indicators and incidence of complications, the difference of the clinical indicators mainly include bed time for the first time and postoperative hospital stay, anal exhaust time three aspects, the incidence of complications mainly observe chills, vomiting, high blood pressure, diabetes, the disease rate of the emergence of four.

Finally, correlation analysis was conducted according to the results obtained by SPSS, if there are significant differences in clinical indicators and incidence of complications between group A and Group B (P<0.05).

**Results and discussion**

**Real-time Quantitative PCR Analysis Results**

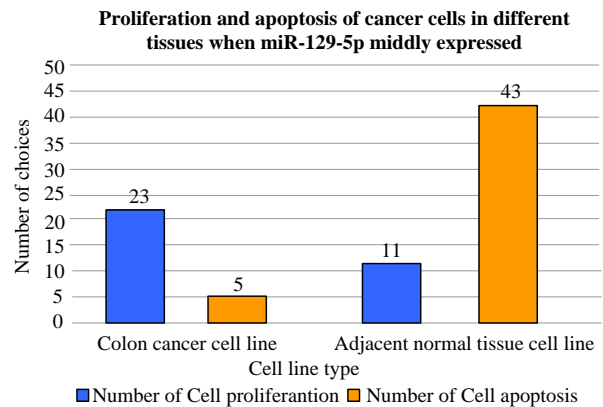
The expression levels of miR-129-5p were also different in different cell line types, as shown in Figure 1. Finally, miR-129-5p was HE, accounting for 12%. This phenomenon indicates that miR-129-5p is mostly in the state of low expression and that the mechanism of action of miR-129-5p in colon cancer cell lines is not obvious, so miR-129-5p should be combined with RSF1 for targeted therapy.



**Figure 1.** The expression level of miR-129-5p in colon cancer and adjacent normal tissues

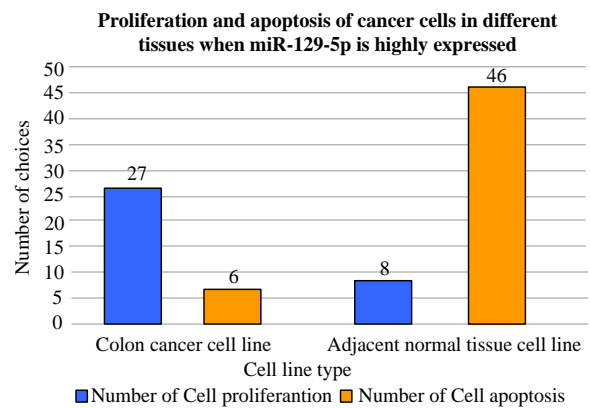
Based on the high expression of miR-129-5p, the proliferation and apoptosis of CC in colon cancer cell lines and adjacent normal tissues were analyzed, and the results were shown in Figure 2. Normal tissue is much lower than that in the colon cancer cell line, and the number of cell apoptosis in the Para cancerous

normal tissue is much higher than that in the colon cancer cell line.



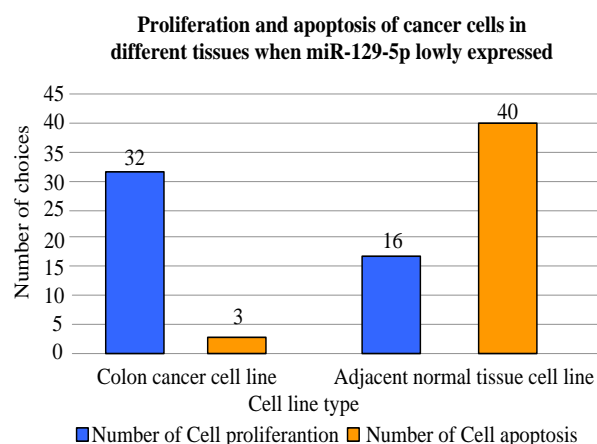
**Figure 2.** Proliferation and apoptosis of CC in different tissues when miR-129-5p in HE

As can be seen in Figure 3, the number of cell proliferation in the para cancerous normal tissues was still lower than that in the colon cancer cell line, and the number of cell apoptosis in the para cancerous normal tissues was still higher than that in the colon cancer cell line.



**Figure 3.** Proliferation and apoptosis of CC in different tissues when miR-129-5p is expressed

The proliferation and apoptosis of CC in colon cancer cell lines and adjacent normal tissues were analyzed, and the results were shown in Figure 4. Cell proliferation in the para cancerous normal tissues was still lower than that in the colon cancer cell line, and the number of cell apoptosis in the para cancerous normal tissues was still higher than that in the colon cancer cell line. This phenomenon indicates that the expression of and the promotion of apoptosis of CC are particularly weakened.



**Figure 4.** Proliferation and apoptosis of CC in different tissues with low expression of miR-129-5p

### Comparative Study Results

The proliferation and apoptosis data of CC and the results were shown in Table 1. In the contrastive study of the first set of results, miR-129-5p expression quantity does not change, namely content of quantity of its expression in the two groups of experiments have no difference ( $p>0.05$ ), and cancer cell proliferation and apoptosis of data is a very big difference ( $p>0.05$ ), to a certain extent that miR-129-5p by targeting a completed RSF1 can inhibit cancer cell proliferation.

**Table 1.** Difference analysis of the first group of comparative studies

	Cell proliferation		Cell apoptosis	
	Number	Percentage	Number	Percentage
miR-129-5p	20	40.00%	18	36.00%
miR-129-5p+RSF1	9	18.00%	48	96.00%

The results obtained by SPSS were used to analyze the differences between patients in group A and Group B in terms of age, gender, clinical indicators and incidence of complications. The results are shown in Table 2, Table 3 and Table 4. We can see that there is little difference in personality and age between group A and group B. Meanwhile,  $t=0.235$  and  $P=0.659>0.05$  in the t-test of age information. In the gender t-test, the results were  $t=0.235$  and  $P=0.895>0.05$ , that is, the age and gender of the patients did not influence the experimental results.

**Table 2.** Age and gender differences of patients in group A and Group B

Group	Age	Sex (Num and Percentage)			
		Men		Women	
A group	33-42.1	10	35.7%	18	64.3%
B group	32.3-41.9	14	50.0%	14	50.0%

As can be seen from Table 3, the time of first bed removal, anal exhaust time and postoperative hospital was shorter ( $P<0.05$ ), and is beneficial to the recovery of colon cancer patients.

**Table 3.** Differences in clinical indicators between group A and Group B

Group	Number	First time to get out of bed	Time of anal exhaust	Length of hospital stay after operation
A group	28	38.6	25.9	6.5
B group	28	56.3	36.5	8.2
t	/	1.658	1.589	1.756
p	/	0.156	0.015	0.256

**Table 4.** Differences in the incidence of complications between group A and Group B (number of patients)

Group	Number	Chills	Vomitin g	High blood pressure	Diabetes
A group	28	2	2	0	5
B group	28	4	3	1	6
t	/	2.365	2.354	2.125	1.985
p	/	0.152	0.254	0.235	0.015

The microRNAs (miRNA) have been widely used in cancer-related studies. As a conservative, short-sequence, non-coding single-stranded RNA, microRNAs affect the function of genes through post-transcriptional regulation (9-11). The miR-129-5p is one of the microRNAs, that is, it is a micro molecule (12, 13), and can also regulate the proliferation of a variety of proteins to produce a tumor suppressor effect (14). RSF1 is a spatial recombination factor and a pro-oncogene, belonging to the family of human core histones and chromatin assembly-related factors (15, 16). Studies have shown that the expression level of this spatial recombination factor is high or even especially high in various tumor tissues, and it is also found to have a great relationship with the prognosis of patients (17-19). Therefore, control of RSF1 gene expression and corresponding therapeutic approaches (such as targeted therapy) are likely to become a novel tumor therapy regimen (20).

The cancer-promoting effect of RSF1 has been highlighted in many cancer clinical studies, but insufficient attention has been paid to the cancer-promoting effect of RSF1 in high expression in recent years, resulting in RSF1 becoming more and more active in the human body, resulting in the suffering of cancer patients (21). Therefore, it is necessary to inhibit or transform the cancer-promoting effect of RSF1, so that it can play a role conducive to human health development and reduce the incidence of cancer (22).

Targeted therapy is the product of the times with the development of society and science and technology, which is forward-looking (23). Targeted therapy is a molecule-based therapy, which is different from the previous methods of surgery, radiotherapy and chemotherapy based on the cellular and molecular level and through specific oncogenic sites (24). Medical scientists have gradually deepened their understanding of cancer from the parenchymal lesions to cells to the molecular level, and a relatively new and less painful way of targeted therapy has emerged (25). It is especially for those with cancer cell growth, proliferation, invasion and metastasis-related genes and molecular research and development of drugs, these drugs enter the human body, fast and target genes and molecules, thus inhibiting their play, promoting tumor cell growth and metastasis of cancer, so as to achieve a precise treatment, prevent cancer and progress of tumor, so as to achieve the role of tumor suppressor (26).

On the one hand, the use of miR-129-5p by targeting a completed RSF1 controls the expression of a completed RSF1 quantity, not only reduces completed RSF1 carcinoma factors promoting, the function of CC can also make a completed RSF1 expression quantity can give play to the role of tumor suppressor. The combination of miR-129-5p and a completed RSF1 may lead to a more effective anticancer effect, the tumor suppressor role in the research of this paper confirms that as well as one of the most important aspects to promote cancer factor in the field of medical research is not very common. It is necessary to supplement the application of pro-cancer factors in cancer research, so as to make up for the lack of research in this field of Chinese medicine.

In general, improving the health quality of people around the world is the fundamental way to prevent

human beings from being attacked by cancer. It is believed that the development of modern medical technology can also protect human beings from being attacked by diseases to a certain extent. In addition, in the analysis of clinical patient data, it was confirmed that the combination of miR-129-5p anti-cancer factor. The results of this study were intended to provide possible treatment options for colon cancer patients, reduce the number of cases worldwide and alleviate the suffering of colon cancer patients.

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#### Interest conflict

The authors declare no conflict of interest.

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