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## **The Emerging Role of Autophagy in Colorectal Cancer: Progress and Prospects for Clinical Intervention**

Autophagy in Colorectal Cancer

Tianfei Ma, Yueren Fan, Yihang Zhao, Bin Liu

### **Abstract**

Autophagy is a physiological mechanism in which cells degrade themselves and quickly recover the degraded cell components. Recent studies have shown that autophagy plays an important role in the occurrence, development, treatment, and prognosis of colorectal cancer. In the early stages of colorectal cancer, autophagy can inhibit the production and development of tumors through multiple mechanisms such as maintaining DNA stability, inducing tumor death, and enhancing immune surveillance. However, as colorectal cancer progresses, autophagy may mediate tumor resistance, enhance tumor metabolism, and other pathways to promote tumor development. Therefore, intervening in autophagy at the appropriate time has broad clinical application prospects. This article summarizes the recent research progress of autophagy and colorectal cancer and is expected to provide new theoretical basis and reference for clinical treatment of colorectal cancer.

**Key Words:** autophagy; self-degradation; colorectal cancer

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**Core Tip:** In the early stages of colon cancer, autophagy can inhibit the production and development of tumors through multiple mechanisms such as maintaining DNA stability, inducing tumor death, and enhancing immune surveillance. However, as colorectal cancer progresses, autophagy may mediate tumor resistance, enhance tumor metabolism, and other pathways to promote tumor development. Therefore, intervening in autophagy at the appropriate time has broad clinical application prospects.

## INTRODUCTION

Colorectal cancer (CRC) refers to malignant epithelial tumors of the colon, rectum, and anal canal. In 2020, CRC was the third <sup>1</sup> most common malignancy and the second most deadly cancer worldwide, with an estimated 1.88 million new cases (9.8%) and 910,000 deaths (9.2%) [1]. Great progress has been made in CRC diagnosis and treatment with the availability of routine health check-ups and new techniques. At present, surgery remains the mainstay of treatment for CRC, while chemotherapy, targeted therapy, and immunotherapy have also been applied in clinical settings. However, due to its insidious onset, CRC is mostly diagnosed in advanced stages and becomes resistant to chemotherapy and targeted therapy [2]. Therefore, the prognosis of CRC is poor. Autophagy plays a critical role in regulating cancer development, and autophagy-based clinical interventions may address this clinical dilemma. This article reviews the recent progress in the research on the association between autophagy and CRC.

## CONCLUSION

Autophagy is an extremely potential therapeutic target for the treatment of rectal cancer, but appropriate interventions should be selected according to the different

**stages of colorectal cancer.** Autophagy can inhibit tumorigenesis in the early stages of CRC by preventing DNA damage, maintaining genomic stability, and inducing apoptosis. However, with the progression of tumors, autophagy can promote CRC growth by enhancing energy metabolism in tumor cells, by mediating drug resistance, and by avoiding tumor cell death. Therefore, autophagy-based CRC treatment strategies should be tailored according to the specific CRC type, tumor stage, and tumor metabolic characteristics. The combination of multiple therapeutic methods can enhance the inhibitory effect of autophagy on tumors and weaken its role as a tumor promoter, therefore playing a key role in CRC treatment.

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