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Pharmacological Targeting of Epithelial-to-Mesenchymal Transition in Colorectal Cancer

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Abstract

Background: Colorectal cancer (CRC) is the third most common cause of cancer deaths, and metastasis is a major cause of mortalities. The survival rate of patients diagnosed with metastasis remains disappointing. Therefore, the prevention of tumor dissemination as well as treatment of existing metastatic lesions is an important focus of new cancer therapies. Epithelial-to-mesenchymal transition (EMT) is defined as a cellular transition from an epithelial to a mesenchymal state and determines cancer lethal characteristics consisting of invasiveness, metastasis formation, and drug resistance.

Methods: We reviewed PubMed and EMBASE libraries to gather data about pharmacological targeting of Epithelial-to-Mesenchymal Transition in colorectal cancer to prevent the tumor metastatic distribution and improve survival of patients with CRC.

Result: We provided an overview of the available EMT-based therapies in CRC, summarized FDA-approved and under-clinical trial drugs with EMT-inhibiting property in metastatic CRC, and described several agents preventing EMT-associated progression and metastasis in preclinical studies. Although various preclinical and clinical findings have proven that inhibiting EMT via different pharmacological approaches can reduce aggressive features of many cancers, not all agents possessing EMT-inhibiting function in preclinical research exhibit improvement in clinical studies.

Conclusion: Combating EMT as a therapeutic intervention with the aim of preventing tumor dissemination, eliminating exiting metastasis, and promoting resistance to therapy may be a novel and effective strategy in the treatment of CRC. Our hope is that further exploration about EMT-related mechanisms and EMT-inhibiting drugs provide more opportunities for us to treat CRC efficiently.

Keywords: Colorectal cancer; Epithelial-to-mesenchymal transition; metastasis; therapies.