



## Epithelial to Mesenchymal Transition (EMT): A New Target for Anticancer Drugs

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**Received:** December 24, 2021

**Published:** January 01, 2022

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The process by which epithelial cells are transformed into mesenchymal cells is called EMT. The epithelial tissue covers the internal and external body surface of an organism. Epithelial cells are polarized and they form the extensive cell-cell adhesions, including the tight junctions, with each other. These cells form the protective barrier for underlying tissues and organs. However, mesenchymal cells are not very well organized in three dimensional extracellular matrixes.

During the process of EMT, the epithelial cells lose their polarity as well as cell-cell adhesions and gain the ability to migrate, proliferate, differentiate and develop into specific tissues and organs.

There are three types of EMT.

- Type I EMT is associated with embryo formation and organ development.
- Type II EMT is associated with repair process such as wound healing, tissue regeneration and organ fibrosis.
- Type III EMT is associated with tumour metastasis.

In Type III EMT, the process of tumour metastasis consists of multiple steps, all of which lead to tumour spreading. First the cancer cells escape from the primary tumour site and in the second step the cancer cells invade the tumour stroma and enter the blood circulation directly or through the lymphatic system. Most of these circulating cancer cells undergo apoptosis. In case these cancer cells survive in the circulation they reach more suitable sites by attaching to the endothelial cells and reaching the surrounding tissues via circulation.

EMT induced drug resistance: Cells undergoing EMT can become invasive and develop resistance to anticancer agents. They

are called Cancer Stem Cells (CSC). CSC has the ability to self renew and give rise to differentiated tumour cells. They are resistant to drug treatment and chemotherapy.

Thus, the need of the Hour is to develop anticancer drugs that can target EMT related pathways thereby preventing CSC formation thereby ultimately preventing the cancer relapse.

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