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Molecular targeted therapy: treating cancer with specificity

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**Abstract**

Molecular targeted therapies are revolutionized therapeutics which interfere with specific molecules to block cancer growth, progression and metastasis. Many molecular targeted therapies approved by the Food and Drug Administration (FDA), have demonstrated remarkable clinical success in the treatment of a myriad of cancer types including breast, leukemia, colorectal, lung, and ovarian cancers. This review provides an update on the different types of molecular targeted therapies used in the treatment of cancer, focusing on the fundamentals of molecular targeted therapy, its mode of action in cancer treatment, as well as its advantages and limitations.

Keywords:

Molecular targeted therapy, cancer, small molecule, monoclonal antibody, therapeutic cancer vaccine, gene therapy

**1. Molecular targeted therapy**

Molecular targeted therapy refers to the use of drugs or other substances that targets specific molecules (molecular targets) to block the growth and spread of cancer cells. The concept for targeted therapy was derived from the idea of “magic bullet” which was first expatiated by Paul Rich in late 1800 (Ehrlich, 1906). It was initially used to depict the ability of a chemical that targets microorganisms specifically, but the method has since been expanded to cancer treatment (Brodsky, 1988).

Identification of ideal targets is essential for a successful development of molecular targeted therapies in cancer. One of the basis of cancer occurrence is dictated by the alteration of the genetic profile which leads to mutation or changes in proteins and receptors that promotes cell survival and proliferation. These

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