Treatment of cancer by targeted therapy.

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Abstract

Targeted therapeutic medications have replaced conventional chemotherapy agents as the go-to cancer treatments due to their advantages in efficacy and safety. A growing number of small-molecule targeted medications have been created for the treatment of malignancies since the US Food and Drug Administration (FDA) authorized the first tyrosine kinase inhibitor imagine to go on sale in 2001. By the end of 2020, both the National Medical Products Administration (NMPA) of China and the US FDA will have approved 89 small-molecule targeted anticancer medications. Despite significant advancements, drug resistance and low response rates are remain major obstacles for small-molecule focused anti-cancer treatments. We reviewed all small-molecule targeted anti-cancer medications in-depth in order to better encourage the development of these medications.

Keywords: Gene therapy, Tumour Markers, Tissue biopsy, Tumor diagnosis.

Introduction

The primary methods for treating cancer are drug therapy, surgical procedure, radiation, and biotherapy. Chemotherapy, which uses chemical medications to either kill tumor cells or stop them from growing and proliferating, was once the only technique of cancer drug therapy [1]. Chemotherapy's main trait, which causes severe toxicity and side effects, is its inability to differentiate between cancer cells and healthy cells. From broad-spectrum cytotoxic medications to tailored drugs, there has been a significant shift in cancer treatment during the past 20 years. 1 Targeted medications have a higher potency and lower toxicity than conventional chemotherapy drugs because they can directly target cancer cells while sparing healthy cells. enthused by the first small-molecule tyrosine's approval [2].

Targeted medications can roughly be divided into two groups: macromolecules and small molecules (e.g., monoclonal antibodies, polypeptides, antibody–drug conjugates, and nucleic acids) [3,4]. Small-molecule targeted therapies have advantages over macromolecule medications in various areas, such as the pharmacokinetic (PK) characteristics, prices, patient compliance, and drug storage and transportation (Supplementary Table S1). Small-molecule targeted therapies continue to advance significantly despite recent competition from macromolecule pharmaceuticals represented by monoclonal antibodies. 89 anti-cancer small molecules in total have received approval in China and the United States to date. The small-molecule anti-cancer medications authorized by the National Medical Products Administration (NMPA) of China and the US FDA since 2001 are listed in Figure 1. These medications have a wide range of targets, including kinases, epigenetic regulatory proteins, and DNA [5].

Conclusion

In conclusion, targeted therapies have altered the way that cancer is treated. However, a lot of patients experience treatment resistance and eventually pass away from tumor development. The essays in this special collection focused on the development of ongoing difficulties with targeted therapies, which have had tremendous success in a subset of tumors having actionable targets, like ALK and ROS1 in NSCLC. The contributing writers are the foremost authorities on each individual subject and should be commended for their exceptional findings, which could soon be used in clinical trials and help patients. We need more research to better understand the processes underlying the intrinsic and acquired resistance to these targeted medicines.

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***Received:** 01-Sep-2022, Manuscript No. AAMOR-22- 80656; **Editor assigned:** 02-Sep-2022, Pre QC No. AAMOR-22-80656 (PQ); **Reviewed:** 16-Sep-2022, QC No. AAMOR-22-80656; **Revised:** 19-Sep-2022, Manuscript No. AAMOR-22-80656(R); **Published:** 26-Sep-2022, DOI: 10.35841/ AAMOR-6.9.141*

***Citation:** Huang T. Treatment of cancer by targeted therapy. J Mol Oncol Res. 2022;6(9):141*