

EDITORIAL

Immunomodulation and antitumor strategies targeting tumor microenvironment

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(This article belongs to the *Special Issue: Immunomodulation and Antitumor Strategies in the Tumor Microenvironment*)

The tumor microenvironment (TME) is the key determinant of cancer initiation, progression, and response to therapy.¹ The TME consists of a heterogeneous network of tumor cells, immune cells, stromal cells, extracellular matrix, and soluble factors that interact dynamically and bidirectionally to shape the tumor phenotype and behavior. The TME also plays a crucial role in modulating the immune system, which can either mount an antitumor response or facilitate tumor evasion and survival. Therefore, understanding the mechanisms of immune regulation in the TME is essential for developing novel immunomodulatory and antitumor strategies that can enhance the efficacy and safety of cancer immunotherapy.

Cancer immunotherapy has emerged as a promising and powerful modality for treating various types of malignancies. Immunotherapy aims to stimulate the immune system to recognize and eliminate tumor cells, either by augmenting the activity of effector cells, such as cytotoxic T lymphocytes and natural killer cells or by blocking the inhibitory signals that dampen the immune response, such as checkpoint molecules.^{2,3} However, despite the remarkable clinical success of some immunotherapeutic agents, such as monoclonal antibodies against programmed cell death protein 1 (PD-1) and its ligand PD-L1, only a subset of patients benefit from these treatments, and many develop resistance or adverse events. Moreover, some tumors are inherently immunologically “cold,” meaning that they have low immunogenicity and poor infiltration of immune cells, which limits the effectiveness of immunotherapy. Therefore, there is a pressing need to identify new ways to overcome the immunological barriers and challenges posed by the TME and to improve the outcomes of cancer patients receiving immunotherapy.⁴

In this special issue, we have gathered a collection of original research articles and reviews that cover various aspects of immunomodulation and antitumor strategies targeting the TME, with the aim of providing a comprehensive overview of the current state of the art and the future directions in this exciting and rapidly evolving field. The articles span a wide range of topics, including the role of immune cells, cytokines, chemokines, and other mediators in the TME; the molecular and cellular mechanisms of immune evasion and suppression in the TME; the identification and characterization of novel targets and biomarkers for immunomodulation and antitumor therapy in the TME; the development and evaluation of novel immunomodulatory and antitumor agents and approaches that target the TME; and the clinical implications and challenges of TME-targeting immunomodulation and antitumor strategies.

We hope that this special issue will stimulate further research and innovation in the field of immunomodulation and antitumor strategies relevant to the TME and contribute to the advancement of cancer immunotherapy. We would like to thank all

***Corresponding author:**Xiaobo Wu
(henrywu@surgery.cuhk.edu.hk)**Citation:** Wu X. Immunomodulation and antitumor strategies targeting tumor microenvironment. *Microbes & Immunity*. 2025;2(1):1-2.
doi: 10.36922/mi.4359**Received:** July 29, 2024**Published Online:** November 20, 2024**Copyright:** © 2024 Author(s). This is an Open-Access article distributed under the terms of the Creative Commons Attribution License, permitting distribution, and reproduction in any medium, provided the original work is properly cited.**Publisher's Note:** AccScience Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

the authors and reviewers for their valuable contributions and insights, and the editorial staff for their support and assistance. We also invite the readers to peruse articles collected in this special issue and to share with us their feedback and comments.

Conflict of interest

Xiaobo Wu is the editorial board member of this journal and the guest editor of this special issue. The author declared that he has no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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