Commentary

Annals of Clinical and Laboratory Research
ISSN 2386-5180

2023
Vol.11 No.4:473

Lymphatic Vessels and Immunotherapy: Enhancing Anti-cancer Immune Responses

Zhou Xiyang*

Department of Immunology, Southern Medical University, Guangzhou, China

Received: 20-Jun-2023, Manuscript No. IPACLR-23-13921; **Editor assigned:** 22-Jun-2023, PreQC No. IPACLR-23-13921 (PQ); **Reviewed:** 05-Jul-2023, QC No. IPACLR-23-13921; **Revised:** 08-Jul-2023, Manuscript No. IPACLR-23-13921 (R); **Published:** 15-Jul2023, DOI: 10.36648/2386-5180.23.11.473

***Corresponding author:**
Zhou Xiyang

xizhou@outlook.com

Department of Immunology, Southern Medical University, Guangzhou, China

Citation: Xiyang Z (2023) Lymphatic Vessels and Immunotherapy: Enhancing Anti-cancer Immune Responses. Ann Clin Lab Res. Vol.11 No.4:473

Introduction

Immunotherapy has revolutionized cancer treatment by harnessing the power of the immune system to fight against cancer. However, not all patients respond equally to immunotherapy, highlighting the need for strategies to enhance anti-cancer immune responses. One promising avenue of research is exploring the role of lymphatic vessels in modulating immune responses within the tumor microenvironment. This article delves into the intricate relationship between lymphatic vessels and immunotherapy, discussing the potential of targeting lymphatic vessels to optimize anti-cancer immune responses. Lymphatic vessels play a crucial role in maintaining tissue homeostasis by draining excess interstitial fluid, solutes and immune cells from tissues and returning them to the bloodstream. In cancer, lymphatic vessels serve as conduits for metastatic spread, facilitating tumor cell dissemination to regional lymph nodes [1].

However, emerging evidence suggests that lymphatic vessels also actively participate in modulating immune responses within the tumor microenvironment. Lymphatic vessels express various chemokines, cytokines, and adhesion molecules that influence the trafficking of immune cells, such as dendritic cells, T cells, and natural killer cells, into and out of the tumor. Understanding the interplay between lymphatic vessels and immune cell trafficking is crucial for designing strategies to enhance anti-cancer immune responses [2].

Enhancing anti-cancer immune responses is a critical area of research and development in the field of cancer treatment. The immune system plays a vital role in identifying and eliminating cancer cells. However, cancer cells can sometimes evade immune detection and suppression, allowing them to grow and spread. Strategies aimed at boosting the immune system's ability to recognize and attack cancer cells are being actively explored. Here are some approaches that have shown promise:

Immune checkpoint inhibitors: Immune checkpoint inhibitors are drugs that block certain proteins on immune cells or cancer cells, allowing the immune system to recognize and attack cancer cells more effectively. Examples include drugs like pembrolizumab (Keytruda) and nivolumab (Opdivo). These drugs have demonstrated significant success in treating various cancers, particularly melanoma, lung cancer, and certain types of lymphoma [3].

Cancer vaccines: Cancer vaccines are designed to stimulate the immune system to target and attack cancer cells. They can be personalized to target specific tumor antigens (proteins present on cancer cells) or designed to boost general immune responses against cancer. Sipuleucel-T (Provenge) is an example of a cancer vaccine used to treat advanced prostate cancer.

CAR-T cell therapy: Chimeric Antigen Receptor T-cell (CAR-T) therapy involves modifying a patient's T cells (a type of immune cell) to express a receptor that targets cancer cells. These modified T cells are then infused back into the patient, where they recognize and destroy cancer cells expressing the targeted antigen. CAR-T therapies have shown remarkable success in treating certain blood cancers, such as leukemia and lymphoma.

Tumor-infiltrating lymphocytes (TIL) Therapy: TIL therapy involves isolating immune cells, particularly T cells, from a patient's tumor, expanding them in the lab, and then infusing them back into the patient. This approach aims to enhance the patient's immune response against the tumor. TIL therapy has shown promise in treating metastatic melanoma [4].

Cytokine therapy: Cytokines are signalling molecules that regulate immune responses. Interleukin-2 (IL-2) and interferon-alpha are examples of cytokines that have been used to stimulate immune responses against cancer. These therapies can enhance the activity of immune cells, such as T cells and Natural Killer (NK) cells, to target and destroy cancer cells.

Given their pivotal role in immune cell trafficking and immune regulation, targeting lymphatic vessels holds great promise for enhancing the efficacy of immunotherapy. Several approaches

are being explored to exploit lymphatic vessels for therapeutic purposes. One strategy involves the selective delivery of immunostimulatory agents or immune checkpoint inhibitors to lymphatic vessels to enhance immune activation within the tumor microenvironment. This approach could overcome the immunosuppressive nature of the tumor and promote robust anti-cancer immune responses. Another approach involves modulating lymph angiogenesis, the formation of new lymphatic vessels, within tumors. Inhibiting lymph angiogenesis can limit tumor metastasis via lymphatic vessels while also altering the immune landscape within the tumor microenvironment. Additionally, manipulating the expression of specific chemokines or adhesion molecules on lymphatic vessels could be used to regulate immune cell trafficking and improve immune cell infiltration into tumors [5].

Conclusion

Lymphatic vessels play a multifaceted role in modulating immune responses within the tumor microenvironment. Exploiting the immunomodulatory properties of lymphatic vessels offers exciting opportunities to enhance the efficacy of immunotherapy. Further research and clinical trials are warranted to fully elucidate the potential of targeting lymphatic vessels as a complementary approach to existing immunotherapies in cancer treatment.

References

1. Jiang X (2020). Lymphatic vessels, miRNAs, and CAR T cells in tumor immunology. J Zhejiang Univ Sci B. 21(1):1.
2. Lund AW, Medler TR, Leachman SA, Coussens LM (2016). Lymphatic vessels, inflammation, and immunity in skin cancer. Cancer Dis. 6(1):22-35.
3. Peng X, Wang J, Zhou F, Liu Q, Zhang Z (2021). Nanoparticle-based approaches to target the lymphatic system for antitumor treatment. Cell Mol Life Sci.78:5139-61.
4. Steele MM, Dryg ID, Murugan D, Femel J, du Bois H, et al (2022). T cell Egress via Lymphatic Vessels Limits the Intratumoral T cell Repertoire in Melanoma. BioRxiv.
5. Vaahtomeri K, Alitalo K (2020). Lymphatic vessels in tumor dissemination versus immunotherapy. Cancer Res. 80(17):3463-5.