OPEN ACCESS Freely available online

Immunogenetics: Open Access

Commentary

Immunotherapy Types and their Mechanism of Action in Treating Cancer

Cheng Wang*

Department of Oncology, University of Zhongshan Hospital of Xiamen, Xiamen, China

DESCRIPTION

Cancer remains one of the most challenging diseases to treat, causing a significant global burden on healthcare systems and impacting millions of lives. However, in recent years, there has been a remarkable breakthrough in cancer treatment called immunotherapy. This innovative approach harnesses the power of the immune system to recognize attack and eliminate cancer cells. With its potential to provide long-lasting responses and improved survival rates, cancer immunotherapy has revolutionized the field of oncology.

Cancer immunotherapy

Immunotherapy works by manipulating the body's immune system to recognize and destroy cancer cells more effectively. Unlike traditional treatments such as chemotherapy and radiation, which primarily target cancer cells directly, immunotherapy enhances the immune response, enabling the body to combat cancer more efficiently.

There are several types of cancer immunotherapy. Each approach utilizes different mechanisms to stimulate or enhance the immune system's ability to fight cancer.

Monoclonal antibodies: These laboratory-produced antibodies bind to specific proteins on cancer cells, helping the immune system identify and attack them. Monoclonal antibodies can also deliver toxic substances directly to cancer cells, aiding in their destruction.

Immune checkpoint inhibitors: Certain molecules on immune cells, known as checkpoints, regulate immune responses. Cancer cells can exploit these checkpoints to evade detection and destruction by the immune system. Immune checkpoint inhibitors block these checkpoints, allowing immune cells to recognize and attack cancer cells more effectively.

Cancer vaccines: Cancer vaccines stimulate the immune system to identify and destroy cancer cells. They can be either preventive, targeting viruses that cause cancer or therapeutic, boosting the immune response against existing cancer cells.

Adoptive cell transfer: This approach involves modifying a patient's own immune cells to enhance their ability to recognize and kill cancer cells. The modified cells are then reintroduced into the patient's body, where they can target and eliminate cancer cells more effectively.

Cytokines: Cytokines are small proteins that regulate immune cell behavior. Interleukins and interferons are cytokines examples used in cancer immunotherapy. They can boost the immune response against cancer cells or inhibit the growth of new blood vessels that tumors need for survival.

Successes and challenges

Immunotherapy has achieved remarkable success in treating various types of cancer. For instance, immune checkpoint inhibitors have shown significant efficacy in advanced melanoma, lung cancer and bladder cancer, leading to durable responses and improved overall survival rates. Additionally, adoptive cell transfer, particularly Chimeric Antigen Receptor (CAR) T-cell therapy, has demonstrated remarkable results in certain blood cancers like leukemia and lymphoma.

Despite these successes, challenges remain in expanding the application of immunotherapy. Response rates can vary among different cancer types and individual patients. Some patients may experience immune-related side effects, including inflammation of healthy organs, due to immune system activation. Additionally, resistance to immunotherapy can develop over time, highlighting the need for further studies and the development of combination therapies.

The rapid advancement of cancer immunotherapy continues to provide hope for patients and healthcare professionals alike. The latest studies focus on understanding the mechanisms of immune evasion employed by cancer cells and identifying new targets for immunotherapy. Combination approaches that combine immunotherapy with other treatment modalities, such as chemotherapy and targeted therapy, are also being explored to enhance treatment efficacy.

Moreover, the development of personalized immunotherapy,

Correspondence to: Dr. Cheng Wang, Department of Oncology, University of Zhongshan Hospital of Xiamen, Xiamen, China, E-mail: wang.cheng@163.com

Received: 02-Jun-2023, Manuscript No. IGOA-23-24762; **Editor assigned:** 05-Jun-2023, Pre QC No. IGOA-23-24762 (PQ); **Reviewed:** 19-Jun-2023, QC No. IGOA-23-24762; **Revised:** 26-Jun-2023, Manuscript No. IGOA-23-24762 (R); **Published:** 03-Jul-2023, DOI: 10.35248/IGOA.23.8.206

Citation: Wang C (2023) Immunotherapy Types and their Mechanism of Action in Treating Cancer. Immunogenet Open Access. 8:206.

tailoring treatments based on a patient's unique immune profile and tumor characteristics, holds great promise for improving outcomes. Biomarkers that can predict response to immunotherapy are being investigated to guide treatment decisions and optimize patient selection.