Checkpoint inhibitors: the immuno-oncology agents blocking cancer cell evasion.

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Abstract

Cancer is a disease caused by the uncontrolled growth and spread of abnormal cells in the body. Cancer cells can evade the immune system, which makes it difficult for the body to fight the disease. Immunotherapy, also known as immuno-oncology, is an approach to cancer treatment that harnesses the power of the immune system to attack cancer cells. In recent years, immuno-oncology agents have emerged as a promising new class of cancer therapies. Immuno-oncology agents work by targeting the immune system to help it identify and attack cancer cells. There are several types of immuno-oncology agents, including checkpoint inhibitors, CAR-T cell therapy, and cancer vaccines.

Keywords: Immuno-oncology, Ipilimumab, Melanoma.

Introduction

Checkpoint inhibitors are a type of immuno-oncology agent that work by blocking the activity of proteins called checkpoints on the surface of immune cells. Checkpoints normally act as brakes on the immune system to prevent it from attacking healthy cells. However, cancer cells can hijack these checkpoints to evade detection by the immune system. Checkpoint inhibitors block the activity of these checkpoints, allowing the immune system to recognize and attack cancer cells. Checkpoint inhibitor is pembrolizumab, which targets the checkpoint protein PD-1. Pembrolizumab has been approved for the treatment of several types of cancer, including melanoma, non-small cell lung cancer, and head and neck cancer. Another checkpoint inhibitor, ipilimumab, targets the checkpoint protein CTLA-4 and is approved for the treatment of melanoma [1].

CAR-T cell therapy is another type of immuno-oncology agent that involves modifying a patient's own T cells to recognize and attack cancer cells. T cells are a type of immune cell that can recognize and attack abnormal cells in the body, including cancer cells. CAR-T cell therapy involves extracting T cells from a patient's blood and modifying them to express chimeric antigen receptors (CARs) on their surface. These CARs allow the T cells to recognize and attack cancer cells that express specific antigens. One example of a CAR-T cell therapy is tisagenlecleucel, which is approved for the treatment of certain types of leukaemia and lymphoma. Tisagenlecleucel targets the antigen CD19, which is expressed on the surface of B cells, including cancerous B cells [2].

Cancer vaccines are another type of immuno-oncology agent that work by stimulating the immune system to recognize and attack cancer cells. Cancer vaccines contain antigens that are specific to cancer cells and can stimulate an immune response against them. Some cancer vaccines also contain adjuvants, which are substances that enhance the immune response. Cancer vaccine is sipuleucel-T, which is approved for the treatment of advanced prostate cancer. Sipuleucel-T contains antigen-presenting cells (APCs) that are activated with a fusion protein called PAP-GM-CSF, which is specific to prostate cancer cells. These activated APCs stimulate an immune response against prostate cancer cells [3].

While immuno-oncology agents have shown promise in the treatment of cancer, they can also cause side effects. Immune-related adverse events (irAEs) are a common side effect of immuno-oncology agents and can range from mild to severe. IrAEs can affect any organ system in the body and can cause a variety of symptoms, including skin rash, diarrhea, and fatigue[4,5].

Conclusion

Immuno-oncology agents have emerged as a promising new class of cancer therapies. They work by targeting the immune system to help it recognize and attack cancer cells. There are several types of immuno-oncology agents, including checkpoint inhibitors, CAR-T cell therapy, and cancer vaccines.

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