

The Key Features and Functions of Endogenous T cells

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DESCRIPTION

Endogenous T cells are a type of T cell that is generated within the body, as opposed to exogenous T cells that originate outside of the body. They play a critical role in the immune system by recognizing and eliminating cells that have become infected with viruses or that have become cancerous.

Endogenous T cells are produced in the thymus gland, which is located in the upper chest, behind the breastbone. The thymus gland is responsible for producing T cells that are capable of recognizing and responding to a wide range of antigens, which are substances that can trigger an immune response.

Once produced in the thymus gland, endogenous T cells travel throughout the body *via* the bloodstream, searching for antigens that match their specific receptor molecules. When an endogenous T cell encounters an antigen that matches its receptor, it becomes activated and begins to multiply rapidly. These activated T cells then migrate to the site of infection or cancer and mount a response to eliminate the affected cells.

One of the key features of endogenous T cells is their ability to recognize and respond to specific antigens. This is achieved through the use of a highly diverse set of receptor molecules on the surface of each T cell. These receptors, known as T cell receptors, are generated through a complex process of genetic rearrangement that occurs in the thymus gland. This process ensures that each T cell has a unique receptor that is capable of recognizing a specific antigen. In addition to their ability to recognize and respond to specific antigens, endogenous T cells also play a critical role in the immunological memory. When an

endogenous T cell encounters an antigen for the first time, it undergoes a process of activation and proliferation to mount an effective immune response.

However, after the infection or cancer has been eliminated, a small population of memory T cells remains in the body. These memory T cells have the ability to quickly recognize and respond to the same antigen if it is encountered again in the future, providing long-term protection against recurrent infections or cancers.

Endogenous T cells can be broadly divided into two main subtypes: CD4⁺ T cells and CD8⁺ T cells. CD4⁺ T cells are responsible for coordinating the immune response by releasing cytokines and other signaling molecules that activate other immune cells. They are also involved in the production of antibodies, which are specialized proteins that can bind to and neutralize antigens. CD8⁺ T cells, on the other hand, are responsible for directly killing infected or cancerous cells. They do this by releasing toxic substances, such as perforin and granzyme, that cause the target cell to undergo programmed cell death, or apoptosis.

Endogenous T cells play a critical role in the immune system by recognizing and eliminating cells that have become infected with viruses or that have become cancerous. Through their ability to recognize and respond to specific antigens, as well as their role in immunological memory, endogenous T cells provide long-term protection against recurrent infections and cancers. Understanding the biology of endogenous T cells is essential for the development of new immunotherapies that harness the power of the immune system to treat a wide range of diseases.

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Received: 12-May-2023, Manuscript No. IDIT-23-24377; **Editor assigned:** 15-May-2023, PreQC No: IDIT-23-24377 (PQ); **Reviewed:** 30-May-2023, QC No. IDIT-23-24377; **Revised:** 06-Jun-2023, Manuscript No: IDIT-23-24377 (R); **Published:** 13-Jun-2023; 10.35248/2593-8509.23.8.145

Citation: Yates AJ (2023) The Key Features and Functions of Endogenous T cells. *Immunol Disord Immunother.* 8:145.

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