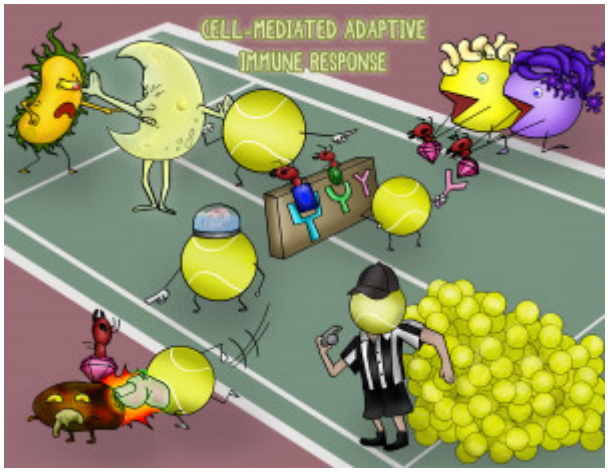
Cell-mediated Adaptive Immune Response

The adaptive immune system uses immune cells to respond to specific infections in the body. It begins when macrophages and dendritic cells in the body’s tissue consume foreign cells and present the antigen on their cell surfaces. T cells then develop antigen specificity in order to attack only cells expressing that antigen on the surface. Each type of T cell has a different role in the adaptive immune response. Regulatory T cells help suppress the immune response of the body in order to prevent unnecessary damage to the body’s own cells. Memory T cells allow the body to respond more quickly by helping activate cytotoxic T cells upon encountering the antigen to which those memory cells were previously exposed. Cytotoxic T cells lyse infected cells, bacterial or viral, and also help kill cancer cells. Finally, infected cells present the antigen on the cell surface so that the T cells can recognize and bind them, as well as antibodies.



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Characteristics

Macrophages and Dendritic Cells Present Antigens

Macaroni-mac-man and Dreadlocks-cell presenting Ant-gem

Macrophages consume pathogens or pathogen-infected cells. Both macrophages and dendritic cells present antigens on the cell surface so that other immune cells can recognize the infection and coordinate a specific response.

T Cell Develops Antigen Specificity

Tennis-ball Matching Receptor to Ant-gem

T cells develop antigen specificity in order to target infected cells with a specific pathogen. This allows them to respond to each pathogen individually and also to create a memory response that will trigger on secondary infection by the same pathogen.

Regulatory T Cells Suppress Response

Referee Tennis-ball Suppressing other Tennis-balls

Regulatory T cells help suppress the immune response in order to prevent unintended damage to the body by non-specific immune processes. Once the pathogen has been eliminated, the immune system must return to its dormant state.

Memory T Cells Cause Faster Secondary Response

Brain Tennis-ball directing second Tennis-ball to attack

Memory T cells persist after an infection has been resolved and duplicate to large numbers of effector T cells upon re-exposure to a pathogen.

Cytotoxic T Cells Lyse Infected Cells

Side-toe-toxic-green Tennis-ball Popping Infected Cell

Cytotoxic T cells destroy cells infected by viruses or bacteria through cell lysis. They also help destroy cancer cells.

Infected Cells Present Antigen On Surface

Sick-cell with Ant-gem on Cell Surface

Any infected cells present antigens on the cell surface in order to trigger the adaptive and humoral immune responses. The humoral immune response involves antibody production.

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