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Introduction to Dendritic Cells

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Maturation of Dendritic Cells

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Maturation of Dendritic Cells

The captured infections and other forms of antigens also carry signals that induce the further development or maturation of dendritic cells. This process begins as dendritic cells take up infections by phagocytosis, forming large vesicles to sample these foreign substances, and then converting them into MHC-peptide complexes, or fragmented proteins. These fragments are sent to their cell surface where they can be recognized by receptors on T cells. Immature dendritic cells have several features that allow them to increase their capacity to convert antigens into MHC-peptide complexes. One feature involves surface receptors, like DEC-205, that increase antigen uptake. Following uptake, the antigens are processed, including a pathway called "cross-presentation" in which dendritic cells take up dead cells from tumors, transplants, and tissues under microbial or autoimmune attack and efficiently extract peptides from them. Another feature is that maturing dendritic cells proceed to make other products that are used to stimulate lymphocytes and guide the development of the immune response. The type of immune response that the dendritic cell orchestrates depends upon the type of maturation stimulus that the infection provides and upon other factors in the immune microenvironment. Maturation is therefore a pivotal process for initiating immunity.