HCV also has the ability to suppress innate immune response, for example, by subverting the activity of TLRs. This ability has been extensively documented by many investigators (123,124,125,126). This subversion accounts, in part, for the ability of HCV to mount infections that are chronic and that cannot be resolved.

Once the dendritic cell has acquired HCV antigens, the dendritic cell migrates to the lymph nodes, where it presents HCV antigens to $CD4^+$ T cells and to $CD8^+$ T cells. This activates the T cells, and the T cells circulate in the bloodstream and eventually encounter the liver. The $CD8^+$ T cells kill hepatocytes that are infected with HCV, where the $CD8^+$ T cells use two methods of killing. The first method, which involves Fas ligand, results in apoptosis of the hepatocyte. The second method, which involves granzyme and perforin, also results in apoptosis of the hepatocyte.

d. Dendritic Cells

Dendritic cells (DCs) are antigen-presenting cells that process antigens, and present them to T cells. DCs also secrete various cytokines, including interleukin-12 (IL-12) and IFN-alpha. DCs occur in two lineages, the *myeloid DCs* and the *plasmacytoid DCs*. The myeloid DCs secrete IL-12, which provokes a Th1-type immune response against hepatocytes infected by HCV. The plasmacytoid DCs secrete interferon-gamma (IFN-gamma), a cytokine having a direct inhibitory effect on HCVs. The immune response against HCV involves both types of DCs (127).

e. Sources of Interferons During HCV Infections

Interferon-alpha (IFN-alpha) and interferon-gamma (IFN-gamma), both naturally expressed and administered as a drug, are issues in HCV infections. Therapeutic IFN-gamma, which is not part of the standard of care for HCV, has been tested for potential therapeutic effects, as shown by Balan et al. (128), and Shin et al. (129).

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