

### c. CD4<sup>+</sup> T Cells and CD8<sup>+</sup> T Cells

The term “CD” means *cluster of differentiation* (132,133). Proteins that are numbered with cluster of differentiation numbers are among the hundreds of membrane-bound proteins residing on the surface of lymphocytes. CD4 is a membrane-bound protein, identified by GenBank Accession No. NM\_000616. CD8 is also a membrane-bound protein, identified by GenBank Accession No. NM\_001145873.

### d. Myeloid DCs and Plasmacytoid DCs

DCs are classified as myeloid DCs and plasmacytoid DCs (134,135).

Myeloid DCs and pDCs have different functions. Myeloid DCs are responsible for presenting antigens to T cells. In contrast to myeloid DCs, pDCs are a rare subset of DCs. pDCs

contribute to antiviral immunity through their ability to produce high levels of IFN-alpha upon activation. pDCs are early responders during systemic viral infections and, in some cases, are the sole producers of IFN-alpha. IFN-alpha expression is crucial for viral clearance during primary viral infections (136). Also, pDCs are found in the microenvironment in tumors (137). IFN-alpha, along with IFN-beta, IFN-omega, IFN-epsilon, IFN-kappa, and IFN-tau, are classified as type I interferons (138,139).

This distinguishes type I interferons from type II interferon. In contrast to the situation with type I interferons, there exists only one type II interferon, namely, IFN-gamma (140,141,142,143). The classification of interferons into type I and type II interferon is not the same as, and is not directly relevant to, the concept of Th1-type and Th2-type response.

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<sup>134</sup>Shortman K, et al. Plasmacytoid dendritic cell development. *Adv. Immunol.* 2013;120:105–26.

<sup>135</sup>Sathe P, et al. Convergent differentiation: myeloid and lymphoid pathways to murine plasmacytoid dendritic cells. *Blood* 2013;121:11–9.

<sup>136</sup>Flores M, et al. FcγRIIB prevents inflammatory Type I IFN production from plasmacytoid dendritic cells during a viral memory response. *J. Immunol.* 2015;194:4240–50.

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<sup>138</sup>Davidson S, et al. Disease-promoting effects of type I interferons in viral, bacterial, and coinfections. *J. Interferon Cytokine Res.* 2015;35:252–64.

<sup>139</sup>Wijesundara D, et al. Unraveling the convoluted biological roles of type I interferons in infection and immunity: a way forward for therapeutics and vaccine design. *Front. Immunol.* 2014;5:Article 412 (7 pp.).

<sup>140</sup>Platanias LC, Fish EN. Signaling pathways activated by interferons. *Exp. Hematol.* 1999;27:1583–92.

<sup>141</sup>Beiting DP. Protozoan parasites and type I interferons: a cold case reopened. *Trends Parasitol.* 2014;30:491–8.

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