Abstract

Dendritic cells (DC) are professional antigen-presenting cells (APC) that play an essential role in the induction of immune responses. DCs develop from CD34+ hematopoietic stem cells in bone marrow and their role is uptake, processing and presentation of antigens to T cells. DCs can be divided into two distinct subset of cells, myeloid a plasmacytoid DCs. Myeloid DCs (mDC) develop from hematopoietic cells in the presence of GM-CSF and TNF-α or from monocytes in the culture with GM-CSF and IL-4, then with CD40L they mature and produce a large number of IL-12, which is important in driving CD4+ T cell to type Th1. The development of pDC is CD40L and IL-3 dependent and Flt3-L supports this process as well. The essential role of pDC is that they secrete a large amounts of type I IFN in the responses to viruses and so they maintain the antiviral stage. To recognize the viruses pDC express Toll-like receptors 7/9. DCs have on the surface also other groups of receptors, e.g. C-type lectin-like receptors, RIG-I-like receptors and NOD-like receptors. They play the role in the various diseases, mostly autoimmune diseases, in which the immune system recognizes self tissues and activates against them the immune response. Dendritic cells function is that they are competent to activate T cells, in the most cases Th1 lymfocytes are responsible for these diseases development, e.g. rheumatoid arthritis, multiple sclerosis, psoriasis and type 1 diabetes mellitus. Significant is also in the future the using of DCs in immunotherapy.