

Role of Dendritic Cells in Vascular Inflammation

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Atherosclerosis is a representative chronic vascular inflammatory disease. Various immune cells are involved in atherosclerosis. Dendritic cells (DCs) induce strong antigen-specific T cell immunity by antigen presentation and may have possible roles in atherosclerosis. In my previous studies, aortic DCs are comprised of two types: a classical Flt3/Flt3L dependent, CD103⁺CD11b⁻ DC and an M-CSF dependent, CD14⁺CD11b⁺DC-SIGN⁺ monocyte-derived DC. Both DC types expanded during atherosclerosis. By crossing Flt3^{-/-} mice to Ldlr^{-/-} atherosclerosis-prone mice, a marked deficiency of classical CD103⁺ DCs developed in the aorta and was associated with exacerbated atherosclerosis. Therefore, functional DCs rather than monocytes are dominant in normal aortic intima and in contrast to macrophages, at least the CD103⁺ classical DCs protect against the development of atherosclerosis. Recently, plasmacytoid DCs (pDCs), a DC subset specialized for type 1 interferon production, also have been reported to have a role in atherosclerosis. To understand the function of pDCs, we used diphtheria toxin-induced cell ablation system and found that pDCs protect against atherosclerosis by generation of regulatory T cells. In this talk, I will summarize the function of dendritic cells in atherosclerosis and suggest possible therapeutic strategy for atherosclerosis.