Roles of Myeloid Cells in the Pathogenesis of Atherosclerosis

Goo Taeg Oh

Department of Life Sciences, Ewha Womans University, 11-1 Daehyun-dong,

Seodaemoon-gu, Seoul 120-750, Republic of Korea

Atherosclerosis is a chronic inflammatory disease that intense immunological pathways play an essential role. During the progression of atherosclerosis, large numbers of inflammatory and immune cells accumulate in intima. The accumulated immune cells, including T cells, macrophages, and dendritic cells (DCs), cross-talk each other, and affect the development of atherosclerosis. Importantly, we found DCs that were poorly phagocytic but were immune stimulatory in the steady state mouse aorta. By crossing *Flt3*$^{-/-}$ to *Ldlr*$^{-/-}$ mice, deficiency of classical CD103^{+} aortic DCs exacerbated atherosclerosis and fewer Foxp3^{+} Treg cells. These data indicate that functional DCs are dominant in normal aortic intima, and CD103^{+} classical DCs are associated with atherosclerosis protection. Also, we identified functional mouse and human pDCs in the aortic intima and showed that selective, inducible pDC depletion in mice exacerbates atherosclerosis. The function of CD137, a member of the tumor necrosis factor receptor superfamily, in mediating atherosclerosis plaque stability remains unknown. We found that activation of CD137 signaling decreases the stability of plaques via its combined effects on T cells, vascular smooth muscle cells, and macrophages. Recently, we show *in vivo* evidence that Ninjurin-1 (Nerve injury-induced protein, Ninj1) is directly cleaved by MMP9 and concomitantly its soluble form (sNinj1), which exhibits anti-atherosclerotic effects with MMP9 in mouse and human atherosclerosis.