Plasmacytoid Dendritic Cells: key antigen presenting cells in experimental atherosclerosis

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Plasmacytoid dendritic cells (pDCs) represent a unique subset of dendritic cells that play a pivotal role in several chronic autoimmune diseases strongly characterized by an increased risk of vascular pathology. Clinical studies have shown that pDCs are detectable in atherosclerotic plaques and others have suggested an association between reduced numbers of circulating pDCs and cardiovascular events. Recent results from mouse models are starting to define the specific role(s) of pDCs in the disease process (Grassia et al., 2013).

We have demonstrated that continuous treatment of apolipoprotein E (apoE)$^{-/-}$ mice with anti-mouse plasmacytoid dendritic cell antigen 1 (mPDCA-1) antibody caused specific depletion of pDCs in the aorta and spleen and significantly reduced atherosclerosis formation in the aortic sinus (by 46%; $P<0.001$). Depletion of pDCs also reduced macrophage (by 34%; $P<0.05$) and increased collagen content (by 41%; $P<0.05$) in aortic plaques, implying a more stable plaque phenotype. Additionally, pDC depletion reduced splenic T-cell activation and decreased IL-12, CXCL1, MIG, IP-10 and VEGF serum levels. Interestingly, the aorta and spleen of both apoE$^{-/-}$ and C57BL/6 mice displayed similar numbers of pDCs, with similar activation status. In contrast, assessment of antigen uptake/processing and presentation, by using DQ-Ovalbumin and the Ea/Y-Ae system, revealed that aortic pDCs in apoE$^{-/-}$ mice were capable of acting as antigen presenting cells *in vivo*.

These data support a key role played by pDCs in promoting atherosclerotic immune responses.

Grassia et al. (2013). *Pharmacology & Therapeutics*. 137, 172-182.