Reducing Auto-inflammation: The Impact of T-Cell Deficiency on Atherosclerosis

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Type 1 diabetes (T1D), a prototypic autoimmune disease, creates several serious complications of which atherosclerosis is the major co-morbid condition. Atherosclerosis is defined by arterial plaque deposition due to coagulation blood products, lipid deposition, and inflammation. The latter has been known for more than a decade but only recently have inflammatory mediators proven to be a beneficial target once traditional treatment has been exhausted. T-cell mediators associated with the CD40-CD154 inflammatory dyad are found in autoimmune diseases such as T1D and rheumatoid arthritis and may be a cause of the added atherosclerotic risk which these disease states maintain. This study seeks to explore the role of T cells in atherogenesis through the use of pro-atherogenic ApoE-/- mice bred to create T cell deficiency (ApoE-/- TCRα-/-) for analysis of the overall effect of T cells in atherogenesis. Mice are sacrificed at 8 months of age and dissected to obtain the aortas and hearts. The aorta is used for en-face Sudan IV staining analysis while serial aortic valve cross sections are used to characterize the lesion in terms of area and content. Analyses of aortic valve cross sections (A-D) and whole aortas (E-F) of this novel model not only demonstrated a significant reduction in overall plaque, but also revealed a change in plaque composition due to T cell deficiency. Future aims are to define the specific subset of pathogenic T cells.