# Dendritic cell subtype protects against atherosclerosis

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Atherosclerosis, commonly referred to as "hardening of the arteries," is a major risk factor for heart attack and stroke. The cause of atherosclerosis is not well understood but, for some time, chronic inflammatory immune responses have been implicated in driving disease pathology. Now, a new study, published online on November 10th by Cell Press from the journal *Immunity*, identifies a type of immune cell that is not associated with promoting disease, but with protection against atherosclerosis. The findings substantially advance the understanding of the complex immune responses associated with atherosclerosis and may guide research to develop new therapeutic interventions.

Atherosclerosis is a vascular disease characterized by the accumulation of fatty material, such as cholesterol, in the wall of an artery. In the early stages of the disease, white blood cells called macrophages ingest the fatty material and become a major constituent of the soft, flaky plaques that narrow the artery and reduce blood flow. Pieces of the plaque can also break away and lodge in the brain, causing a stroke. Although this role for macrophages is well established, there are still many unanswered questions about the involvement of other types of immune cells, such as dendritic cells (DCs).

In the paper, the authors explain that, "The precise definition of the development and function of the immune cells in normal and diseased blood vessels is increasingly important. Although macrophages in the large vessels have been the object of longstanding and considerable research, studies on aortic DCs are more recent and less numerous."

Senior study author, Dr. Ralph M. Steinman from Rockefeller University, was awarded the Nobel Prize for Physiology and Medicine on October 3, 2011, but unfortunately died three days before receiving the news. "In our study we compared DCs and macrophages side by side in the mouse aorta, whereas prior work has focused on one cell type or the other" say the co-first authors Drs. Jae-Hoon Choi and Cheolho Cheong.

Using a mouse model of atherosclerosis, the researchers discovered that there were more DCs than macrophages in the aorta and that there were two distinct types of DCs, "classical" DCs and DCs that were derived from white blood cells called monocytes. Interestingly, mice engineered to have fewer classical DCs developed more severe atherosclerosis. This suggests that although most types of immune cells are thought to exacerbate atherosclerosis, classical DCs may have a protective function.

Steinman and colleagues wrote that, "These findings provide a more precise developmental and functional picture of the cell types in the aorta and support the view that the immune response in atherosclerosis is a double edged sword, with one subset of DCs providing a protective edge." "Further, understanding the roles of DCs and their origins in atherosclerosis is providing new insight for the treatment of atherosclerosis" adds co-author Dr. Goo Taeg Oh from Ewha Women's University in Korea.

Provided by Cell Press