



Review

ICAM-1 signaling in endothelial cells

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Abstract:

Intercellular adhesion molecule-1 (ICAM-1; CD54) is a 90 kDa member of the immunoglobulin (Ig) superfamily and is critical for the firm arrest and transmigration of leukocytes out of blood vessels and into tissues. ICAM-1 is constitutively present on endothelial cells, but its expression is increased by proinflammatory cytokines. The endothelial expression of ICAM-1 is increased in atherosclerotic and transplant-associated atherosclerotic tissue and in animal models of atherosclerosis. Additionally, ICAM-1 has been implicated in the progression of autoimmune diseases.

We and others have shown that the ligation of ICAM-1 on the surface of endothelial or smooth muscle cells with monoclonal antibodies, *via* its main leukocyte ligand, lymphocyte function associated molecule (LFA)-1, or with antibodies derived from patient serum, leads to the activation of several proinflammatory signaling cascades, and to the rearrangement of the actin cytoskeleton.

A circulating or soluble form of ICAM-1 (sICAM-1) has been measured in various body fluids, with elevated levels being observed in patients with atherosclerosis, heart failure, coronary artery disease and transplant vasculopathy. sICAM-1 has signaling properties in several cell types, including EC, and invokes a range of proinflammatory responses.

Thus, we propose that in addition to acting as a leukocyte adhesion molecule, ICAM-1 directly contributes to inflammatory responses within the blood vessel wall by increasing endothelial cell activation and augmenting atherosclerotic plaque formation.

Key words:

intercellular adhesion molecule-1, endothelial cells, inflammation, atherosclerosis, trans-endothelial migration, antibodies, soluble adhesion molecules, cell signaling
