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Short Communication

Inflammation and Cell Adhesion Molecules

Sato Suzuki*

Department of Molecular Biology, University of Tokyo, Japan

Cell adhesion molecules (CAMs) are a subset of cell adhesion proteins found on the cell surface that participate in cell adhesion by attaching to adjacent cells or the extracellular matrix (ECM). Cell adhesion molecules, in a nutshell, help cells adhere to each other and to their surroundings. The importance of cell attachment in tissue structure and function cannot be overstated.

These molecules play an important part in producing force and movement in fully formed animals, ensuring that organs can perform their jobs. Cell adhesion affects cellular mechanisms of growth, contact inhibition, and apoptosis in addition to acting as "molecular glue." CAMs with abnormal expression frequently cause diseases ranging from frostbite to cancer. CAMs are single-pass transmembrane receptors with three conserved domains: an intracellular domain that interacts with the cytoskeleton, a transmembrane domain, and an extracellular domain. These proteins are capable of interacting in a variety of ways [1].

Adhesion molecules are cell surface proteins that facilitate cell-to-cell or cell-to-extracellular matrix interactions (ECM). Immunoglobulin-like adhesion molecules, integrins, cadherins, and selectins are the four families of adhesion molecules. T cells are activated by antigen-presenting cells in lymph nodes and subsequently travels through the endothelium to the site of inflammation, where they assist eradicate invading pathogens in a normal T-cell mediated immune response. Adhesion molecules play a crucial role in this process. Adhesion molecules cause T cells' rolling, activation, stable arrest, and transmigration when they respond to chemokine's.

The interaction of T-cell surface adhesion molecules, L-selectin,2 4 integrins3, and lymphocyte function-associated antigen-1 (LFA-1),4 with their respective endothelial ligands, glycosylation-dependent cell adhesion molecule-1 (GLYCAM1), vascular cell adhesion molecule-1 (VCAM-1) and inter-cytic adhesion molecule-1 (VCAM-1) and inter-cytic adhesion. E-selectin and P-selectin, which are involved in leukocyte rolling, are also expressed by endothelial cells. Chemokines and other chemoattractants stimulate leukocytes, causing conformational changes and clustering of their surface adhesion molecules, particularly integrins, after they have transiently rolled along the endothelium. Adhesive ligand-receptor binding is increased as a result of these alterations [2].

Integrins selectins, cadherins, members of the immunoglobulin superfamily (IgSF) including nectins, and others such as mucins are the five types of adhesion molecules. Certain enzymes, such as vascular adhesion protein 1 (VAP-1), play a role in cell adhesion in addition to the traditional adhesion molecules. Apart from structural differences, cell adhesion molecules also bind to different ligands. Integrins typically bind to the extracellular matrix, while selectins, cadherins, and IgSF members are associated with cell-cell adhesion. Immune cell integrins, on the other hand, bind to soluble ligands as well as ligands on other cells [3].

The cell-cell adhesion mediating molecules can further be differentiated by their ligands as selectins bind carbohydrates in a calcium dependent manner, cadherins mediate preferred homophilic connections in a calcium-dependent manner and the IgSF subfamily nectins mediate homophilic and heterophilic bonds. Because of the role of CAM in cancer metastasis, inflammation, and thrombosis, it is a promising therapeutic target. For example, prevent metastatic cancer cells from extravasating and colonising secondary sites. This has been shown to work in metastatic melanoma that has spread to the lungs.

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***Correspondence to:** Sato Suzuki, Department of Molecular Biology, University of Tokyo, Japan; E-mail: sato231@gmail.com

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