

10. Regulation of carbohydrate-mediated cell-cell interactions involved in leukocyte homing by fucosyltransferases and 6-O-sulfotransferases

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Selectins mediate routine homing of lymphocytes and inflammatory mobilization of leukocytes. Two kinds of carbohydrate ligands for selectins are noted on leukocytes. One is the conventional non-sulfated carbohydrate ligand, sialyl Lewis^X, involved in the recruitment of leukocytes to inflammatory lesions. Sialyl Lewis^X is constitutively expressed on granulocytes and monocytes, and these cells are ready to infiltrate the extravascular area whenever a sufficient amount of selectins is expressed on the vascular bed. The other is the sulfated form of the ligand, sialyl 6-sulfo Lewis^X, which has an extra sulfate residue attached to the C-6 position of GlcNAc. This determinant is expressed on high-endothelial venules of lymphoid tissues and cell lineage-specifically expressed on the restricted subsets of resting leukocytes. The sulfated ligand mediates routine homing of naïve T cells to peripheral lymph nodes and also routine migration of gut- or skin-homing of specific subsets of helper memory T cells. It is noteworthy that sialyl 6-sulfo Lewis^X is preferentially involved in the routine homing process of various subsets of helper T-lymphocytes under non-inflammatory conditions. Fucosyltransferases and 6-O-sulfotransferases figure heavily in the regulation of expression of these carbohydrate determinants, which will be the main topic of this presentation.