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Mast Cells in Control of Transendothelial Transport. The Role of Histamine

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The influence of human mast cells (MC) (MHC-1 line) on transendothelial transport of albumin and low-density lipoproteins (LDL) was studied using a two-chamber system with 1- μ m pore size. Human endothelial cells (line EA.hy926) were grown in the upper chamber coated with type I collagen for 2–3 days before forming a visual monolayer. After that, 200 mkg/mL of LDL and 200 mkg/mL of albumin were added to the upper chamber, and MC were added to the lower chamber, either intact or activated by aggregated human IgG or by compound 48/80. Transendothelial transport of proteins (their passage from the upper chamber to the lower chamber) was evaluated after 5 and 24 hours of incubation. In the presence of MC, either intact or activated with aggregated human IgG or compound 48/80, there was a significant decrease in transendothelial transport of albumin and LDL after incubation for 24 hours, but not for 5 hours. The LDL transport was more sensitive to the inhibitory effect of MC than the albumin one. The suppressive effect of MC was dependent mainly on histamine, since it was canceled by the histamine H1 (but not H2) receptor blocker.

Keywords: endothelium, EA.hy926, mast cells HMC-1, histamine, transendothelial transport, low-density lipoproteins, albumin