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BRIEF COMMUNICATION

PASSAGEWAY FOR RECIRCULATING LYMPHOCYTES IN LYMPH NODE OF THE RAT

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Migrating lymphocytes from high endothelial venules (HEV) enter the medullary sinus through the parenchyma of the lymph node. The morphologic basis for this phenomenon, however, is still unsubstantiated. Accordingly, we examined rat mesenteric lymph nodes and hemolymph nodes by scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The passage of lymphocytes migrating from blood to lymph was followed with special attention paid to the HEV and lymphatic labyrinth in the nodal inner cortex.

MATERIALS AND METHODS

Male Wistar rat tissues were fixed by arterial perfusion with glutaraldehyde and tannic acid. Mesenteric lymph nodes and hemolymph nodes were removed; one half were processed for SEM, the other half were processed for TEM. Respective observations were made in a Hitachi S-450 LB. SEM and H-600 TEM.

RESULTS

High endothelial venules (HEV)

The HEV was readily recognized by its thick endothelium, and the migration of numerous small lymphocytes across the vessel wall was distinctly evident. As shown in *Figs. 1-4*, many

lymphocytes are located between the endothelial cells, while other lymphocytes have penetrated and lie within the endothelium. Some lymphocytes in transit across the endothelium appear as solitary cells surrounded by endothelial cells (*Figs. 3,4*) but other lymphocytes form clusters of two or more cells among the endothelial cells.

Lymphatic labyrinth

In the inner cortex of the lymph node and hemolymph node, the labyrinth is densely filled with small lymphocytes. Structurally, the labyrinth consists of lobular and saccular spaces, and lymphocytes originating from the periphery of the germinal centers and from around the HEV pour into the medullary sinuses (*Figs. 5,6*). The labyrinth is limited by a thin sheet of lining cells and supported by a few sinus reticular cells. The lining cells sometimes possess small pores which facilitate the passage of lymphocytes. Lymphocytes located within the labyrinth are, in general, small in size (approximately 5μ in diameter) and covered with numerous microvilli. Few macrophages are seen within the labyrinth.

COMMENT

These data support that migrating lymphocytes traverse the HEV by both

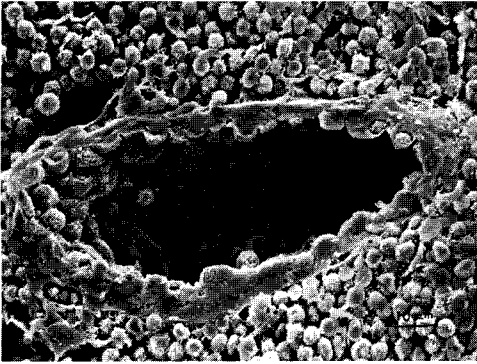


Fig. 1. Appearance of high endothelial venule (HEV) in the inner cortex.

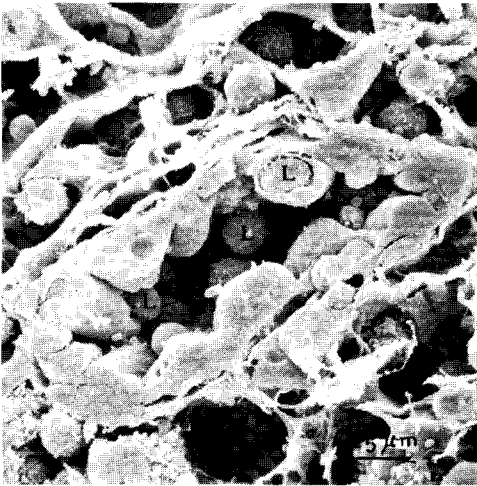


Fig. 2. Appearance of an HEV and the surrounding part of the medullary cord. Migrating lymphocytes (L) found in a circular defect in the endothelium and in luminal surface of the HEV.

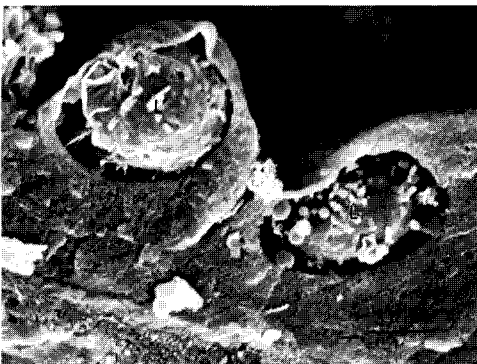


Fig. 3. Appearance of the wall of an HEV. Lymphocytes (L) are found in round defects in the endothelium.



Fig. 4. TEM view of lymphocytes (L) passing through the endothelial cells. This phenomenon is probably the same as that shown in Fig. 3.

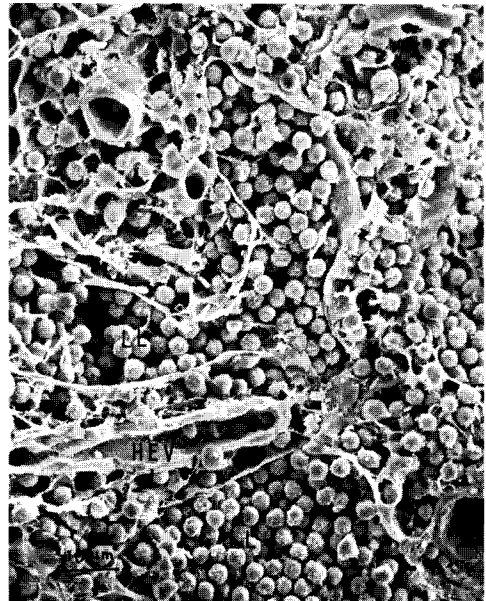


Fig. 5. Appearance of the inner cortex. An HEV is longitudinally opened at the lower left. The lymphatic labyrinth (LL) is shown near the HEV.

an intraendothelial and interendothelial pathway. Most lymphocytes in nodal efferent lymph derive from the circulating blood, and the HEV represents the prime site of lymphocyte migration from the bloodstream. Because the labyrinth surrounds the HEV, on the one hand, and continues as the medullary sinus, on the other hand, it is likely that lymphocytes passing through

the HEV enter the sinus through this labyrinth and thereby leave the lymph node to gain access to efferent lymph.

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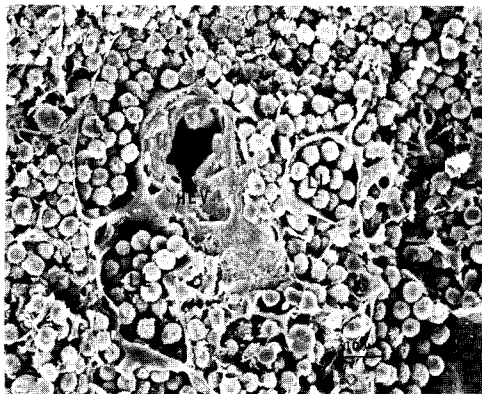


Fig. 6. Lymphatic labyrinth (LL) surrounding an HEV and containing densely packed lymphocytes.