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Author(s)	HOSHI, Nobuhiko
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MORPHOLOGICAL STUDIES ON PIG LYMPH NODES

Nobuhiko HOSHI

*Department of Veterinary Anatomy
Faculty of Veterinary Medicine
Hokkaido University, Sapporo 060, Japan*

The general structures, the mode of intranodal lymph flow (by using colloidal carbon) and the thymus-dependent area of the pig lymph nodes, known as "Reversal type of lymph nodes", were microscopically and immunohistochemically studied.

The pig lymph nodes, which consisted of many lymphoid segments, "nodular units", consisted of many pits and convexes. Several efferent lymphatics were separated from the pits (E-type hilus) and the convex surfaces, while the afferent ones were present in the other pits (A-type hilus). The well-developed trabecular tissues branched off from the A-type hilus into the nodular units. "Cortex-like tissues" were located not only in the central area of the nodular units, but also in the subcapsular areas surrounding the A-type hilus. On the other hand, almost all the "medulla-like tissues" were distributed in the subcapsular areas around the E-type hilus. Therefore, nodular units showed various types of regional interrelations between the cortex- and the medulla-like tissues in a section. Examination of the aggregation of these nodular units revealed the nodes to be the most complicated.

At first the carbon particles from afferent lymphatics entered the central cisternae, which possessed lymphatic valves, and continued into the intra-trabecular lymph channels with valves and peri-trabecular sinuses along the cortex-like tissues. Then they migrated successively into the peri-trabecular sinuses facing the medulla-like tissues. Some particles penetrated the subcapsular sinuses around A-type hilus from the central cisternae, going directly toward the medulla-like tissues. Finally, almost all the carbon particles accumulated in the medulla-like tissues, which consisted of fine plexus of collagen fibers. Therefore, no clear routes from the medulla-like tissues to the efferent lymphatics were demonstrated in this study. The routes to the adjoining units through the subcapsular sinuses were observed.

The anti-pig thymocyte serum-positive lymphocytes were distributed exclusively in the spacious cortex-like tissues, which were rich in postcapillary venules, except for the germinal centers. These areas occasionally faced the subcapsular sinuses around A-type hilus or the peri-trabecular sinuses.

These results suggest the following points. 1) In the regional interrelation between the cortex- and mudulla-like tissuses, the "Typical reversed architectures" in the pig lymph nodes mentioned hitherto in many textbooks are clarified as only one of the features in many sectional situations. 2) The mode of intranodal lymph flow is extremely complicated in comparison with that of other mammals. 3) The characteristic thymus-dependent area in pig lymph nodes may be significant for its role in systemic immunological defense.