

Developmental Expression of LYVE-1 in Mouse Kidney

Hyun-Wook Lee · Wan-Young Kim · Hyun-Kuk Song · Eun-Young Park · Jin Kim

*Department of Anatomy and MRC for Cell Death Disease Research Center,
College of Medicine, The Catholic University of Korea, Korea*

Lymphatic vessel endothelial hyaluronan receptor (LYVE)-1 has been identified as a major receptor for hyaluronan on the lymph vessel wall. Lymphatic vessels play an important physiological role in homeostasis, metabolism, and in the immune response to pathogens. Interstitial fluid can leave the kidney by two different lymphatic networks, a superficial capsular system and a deeper hilar system. Our knowledge of the distribution of lymphatics within the kidney, however, is restricted. The intent of the present study was to examine the time of expression and the distribution of intrarenal lymphatics in the developing mouse kidney by immunohistochemistry using antibody to LYVE-1. Kidneys from 13-, 15-, 16-, and 18-day-old fetuses, 1-, 4-, 7-, 14-, 21-day-old pups, and adults were studied. In embryonic kidneys, LYVE-1 positive lymphatic vessels were first observed around the developing arcuate arteries at 15 days of gestation. LYVE-1 positive lymphatic vessels networks in the cortex were first detected at 18 days of gestation. In postnatal kidneys, LYVE-1-positive lymphatic vessels were gradually developed along the arteries including arcuate arteries. At 21 days after birth, lymphatic vessels were distributed along the arcuate arteries, interlobular arteries, and afferent arterioles in the cortex as in adult kidney. There were no LYVE-1 positive lymphatic vessels in the renal medulla in any developing ages. Interestingly, LYVE-1 immunoreactivity was observed in dendrite-like cells with irregular thick cytoplasmic processes as well as lymphatic vessels. These LYVE-1 positive dendrite-like cells were observed mainly at the border between the cortex and the renal medulla at 13 days of gestation and increased in the cortex and the medulla at 16 days of gestation. In postnatal kidney, LYVE-1 positive dendrite-like cells were disappeared in the inner cortex. In the medulla, number of LYVE-1 positive dendrite-like cells were gradually increased until 4-day-old pups and then remarkably decreased after 7-day-old pups. Finally, the presence of LYVE-1 in dendrite-like cells suggests that LYVE-1 has functions beyond the development of lymph vascular system.