L-type amino acid transporter 1 and 4F2 heavy chain on tumor microvasculature in N-butyl-N-(4-hydroxybutyl)nitrosamine rat bladder carcinoma; microscopy electron immunohistochemical analysis

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System L is a major nutrient transport system responsible for the Na⁺-independent transport of large neutral amino acid including several essential amino acids, consisted of the L-type amino acid transporter1 (LAT1) and the heavy chain of 4F2 cell surface antigen (4F2hc), and up-regulate to support several malignant tumor cell growth in vitro. As tumor angiogenesis is critical for tumor cell growth in vivo, the present study employed an ultrastructural immunohistochemical analysis for clarify the LAT1/4F2hc expression at microvessels in N-butyl-N-(4-hydroxybutyl) nitrosamine (BBN) induced rat bladder carcinomas composed of many LAT1/F2hc expressed tumor cells. Normal, hyperplastic, and papilloma microvessels composed non-fenestrated typed endothelial cell, while bladder carcinoma microvessels composed fenestrated or non-fenestrated typed endothelial cells. LAT1/4F2hc exclusively distributed the luminal and abluminal cell membranes including some membranous vesicles and some lysosomes of the fenestrated typed endothelial cells, but the non-fenestrated typed endothelial cells and pericytes did not. LAT1/4F2hc expression at tumor angiogenic microvessels seemed to be responsible to supply nutrition to BBN bladder carcinoma.