Characterizing the Distribution of LYVE-1+ Macrophages on Various Clinical Tissues

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Abstract

Lymphatic vessel endothelial hyaluronan receptor-1 (LYVE-1) expressing tissue resident macrophages has been reported to exhibit various important roles in different tissues & organs in steady state. Their roles may adapt specifically in the tissue environment during disease onset. Clinical human samples are often processed in formalin-fixed paraffin embedding (FFPE) making it challenging for traditional immunohistochemistry (IHC) methods to be successful due to folding epitopes or loss of tissue integrity, thus leading to weak signals and high autofluorescence. Using Opal 3-plex kit from Akoya Biosciences, this chemistry based on Tyramide Signal Amplification (TSA) allows us to detect multiple fluorescence targets using unlabelled primary antibodies raised in either rabbit or mouse species. Using FFPE human umbilical cord, we first validated the presence of LYVE1+ macrophages as reported in literature using frozen cryo-sections. In clinical aorta, femoral artery, and kidney specimens, there was a decrease in LYVE1+ mac in aged aorta, atherosclerotic arteries, and renal cell carcinoma (RCC) kidney capsule. These characterization data set the foundation for future studies to elucidate the role of LYVE-1+ macrophages in different tissues and disease states. Subsequently, adding more targets (6-plex) and multispectral imaging on Vectra system that supports effective signal unmixing for phenotyping will provide us with more detailed and quantitative information on different cell types or microenvironment interactions present in human clinical samples.