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Kinetics of label retaining cells in the developing rat kidneys

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The kidney is a specialized low-regenerative organ with several different types of cellular lineages. The BrdU label-retaining cell (LRCs) approach has been used as part of a strategy to identify tissue-specific stem cells in the kidney; however, because the complementary base pairing in double-stranded DNA blocks the access of the anti-BrdU antibody to BrdU subunits, the stem cell marker expression in BrdU-labeled cells are often difficult to detect. In this study, we introduced a new cell labeling and detection method in which BrdU was replaced with 5-ethynyl-2-deoxyuridine (EdU) and examined the time-dependent dynamic changes of EdU-labeled cells and potential stem/progenitor markers in the development of kidney. Newborn rats were intraperitoneally injected with EdU, and their kidneys were harvested respectively at different time points at 1 day, 3 days, 1 week, 2 weeks, and 6 weeks postinjection. The kidney tissues were processed for EdU and cellular markers by immunofluorescence staining. Our data found that at 6-week time point, EdU-labeled LRCs existing in the glomeruli expressed undifferentiated podocyte and endothelial markers at high rates, while those in the renal tubules expressed Nestin and vascular markers at low rates. To understand the characterization and localization of these EdU-LRCs, further studies will be needed to test cell lineage tracing, clonogenicity and differentiation potency, and the contributions to the regeneration of the kidney in response to renal injury/repair.

Biography

Jianwen Wang has completed his PhD degree from Capital Medical University in 2009, and completed his Post-doctoral studies from School of Medicine at University of California San Francisco in 2013. He is the Attending Doctor of Department of Urology, Beijing Chao Yang Hospital. He has published many papers on the treatment of genitourinary tract tumors and urolithiasis.

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