

Title: Unravelling the origins of the renal lymphatics

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Abstract:

There is a paucity of information regarding how the lymphatic system of the kidney develops. Historically, identifying lymphatics has been challenging and requires multiple markers together with appropriate imaging techniques. We have overcome these difficulties by combining wholemount immunofluorescence for early lymphatic markers Prox1 and Lyve1 with three-dimensional imaging of mouse embryonic kidneys. Our data shows that the majority of the renal lymphatics arise from embryonic day 13.5 as a plexus restricted to the renal hilum. These vessels extend along the renal pelvis with lumen formation occurring later in nephrogenesis. Additionally, we identified a novel population of Prox1⁺/Lyve1⁺ cell clusters which are unconnected to the main lymphatic tree. These findings suggest that the lymphatic endothelium arises in the kidney by a combination of both lymphangiogenesis and lymphvasculogenesis. Further studies are required to examine the origin and role of lymphatics during kidney development.