

Supplemental Data:

Supplemental Figure S1. *Pax3-cre* is expressed in the metanephric mesenchyme and its derivatives (A, B) E13.5; (C) E16.5. *Pax3-cre^{tg/+}; Rosa26R^{tg/+}* kidneys are stained with X-gal (blue) and cytokeratin8 (brown). Bar: 0.1mm.

Supplemental Figure S2. Notch2 mutant kidney develop renal tubules despite a flattened papilla and a collapsed pelvis. (A, D) wild type; (B, C, E) Notch2 mutant. Arrow and star in (A) indicate the papilla and the pelvis, respectively. (A) and (B) are stained with H&E. (C, D, E) are stained with cytokeratin8 (brown, and turquoise arrowhead), and hematoxylin. Green arrowhead: cytokeratin8-negative renal tubules. Bar, 0.1mm (A, B, C) and (D, E).

Supplemental Figure S3. (A, B) *Pax2-cre^{tg}* from A. Grove is expressed in the urogenital organ. *Pax2-cre^{tg/+}; Rosa26R^{tg/+}* embryos are stained with X-gal. (A) Whole-mount staining of the kidney in which the ureter (U), the Wolffian duct (W) and the Mullerian duct (M) are visible. (B) Histology of the X-gal-stained kidney. Notice the blue. Mesenchymal cells in the nephrogenic zone, the blue renal epithelia and the blue ducts. Bar: 0.1mm. (C,D). No accumulation of NICD was detected in renal epithelia of *Pax2-cre^{tg/+}; N1^{fl/Δ}* embryos; S-shaped bodies are detected in *Pax2-cre^{tg/+}; N1^{fl/+}* embryos (yellow arrowheads). (E, F, H, K,L) Staining for the full length Notch1 protein with a rabbit antibody raised against the intracellular domain. (E-F) wild type metanephroi in organ culture contain Notch1 in duct and renal epithelia. Basal is indicated in E with a dashed pink line, arrowhead indicates the apical side. Note the baso-lateral and apical distribution of Notch1 in the duct. Apical staining is intensified in renal epithelia; low signal is detected in the nucleus of S-shaped bodies (E). (G-L) Notch1-deficient metanephroi. Pax2-positive ducts (arrowhead) and Pax2, N-CAM-positive renal epithelia are present but no Notch1 staining is detected. (I-L) adjacent sections were labeled with several antibodies (indicated in the

figure). Fiduciary points are marked with asterisk. A jagged1 positive, N-CAM positive, Pax2-positive, Notch1 negative RV is marked with an arrowhead. Non specific background is marked with a diamonds in K, L.

Supplemental Figure S4. *Dll-1^{LacZ}* is expressed in the renal vesicle, the S-shaped body, and the proximal tubule segments (A-E: E17 kidneys). (A) Whole-mount X-gal staining. In (B and C) the section is also stained with LTL (brown) and hematoxylin. Notice that inside a renal corpuscle the X-gal-stained cells are the red blood cells in the glomerulus capillary, not the podocytes. The proximal tubule segment that connects the Bowmen's capsule (S1) is not blue. (D) E-cadherin (brown) partially overlaps with X-gal staining (blue) in *Dll-1^{LacZ}* S-shaped body (arrowhead). (E) The pattern of N1ICD expression is similar to *Dll-1^{LacZ}*. Arrow in both (D) and (E) indicates podocyte precursors. S1: proximal tubule segment 1. S2: proximal tubule segment 2. S3: proximal tubule segment 3. Bar: 0.1mm (A, B, C), 0.05mm (D, E). (F). Kidneys from *Dll-1^{hyp/LacZ}* embryo (E18) stained with LTL (brown) and Hematoxylin. Note that only few LTL positive proximal tubule formed but many glomeruli are present, which can be clearly seen when Hematoxylin-Eosin stained sections are shown side by side (G and H). Red arrow: glomerulus. Green arrow: proximal tubule. Turquoise arrowhead: collecting duct. PT: proximal tubule.

Fig. S1:

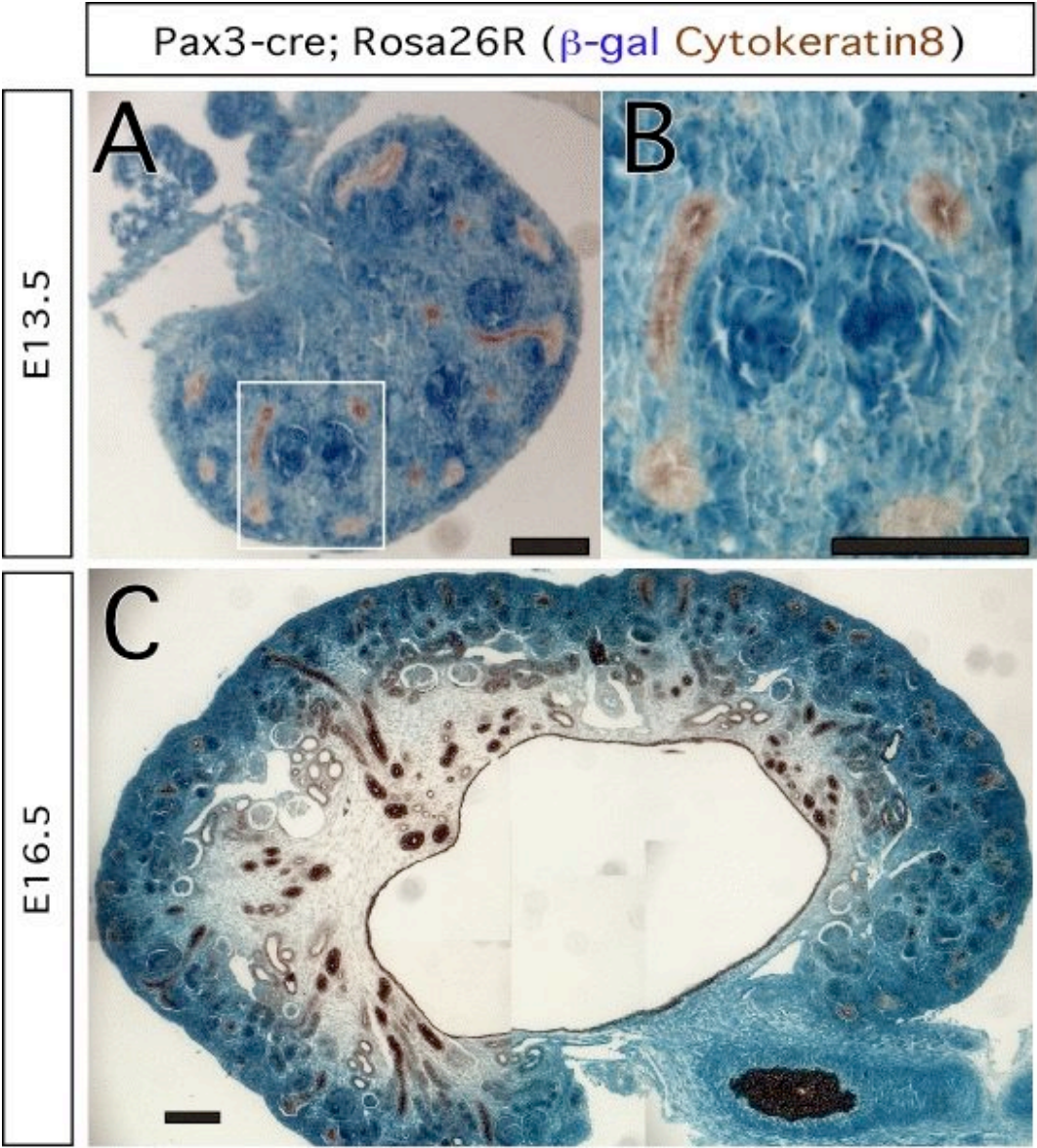


Fig. S2:

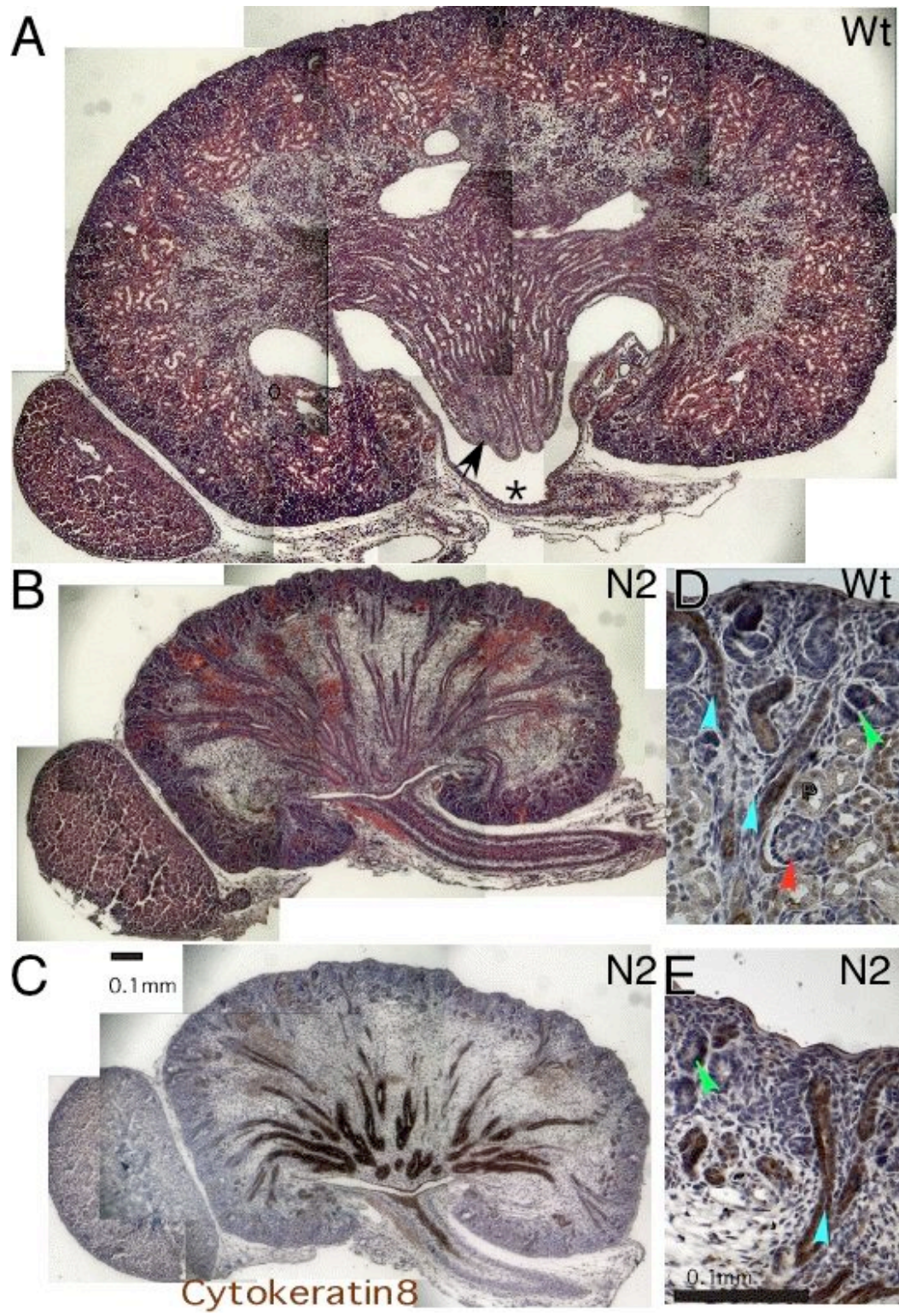


Fig. S3:

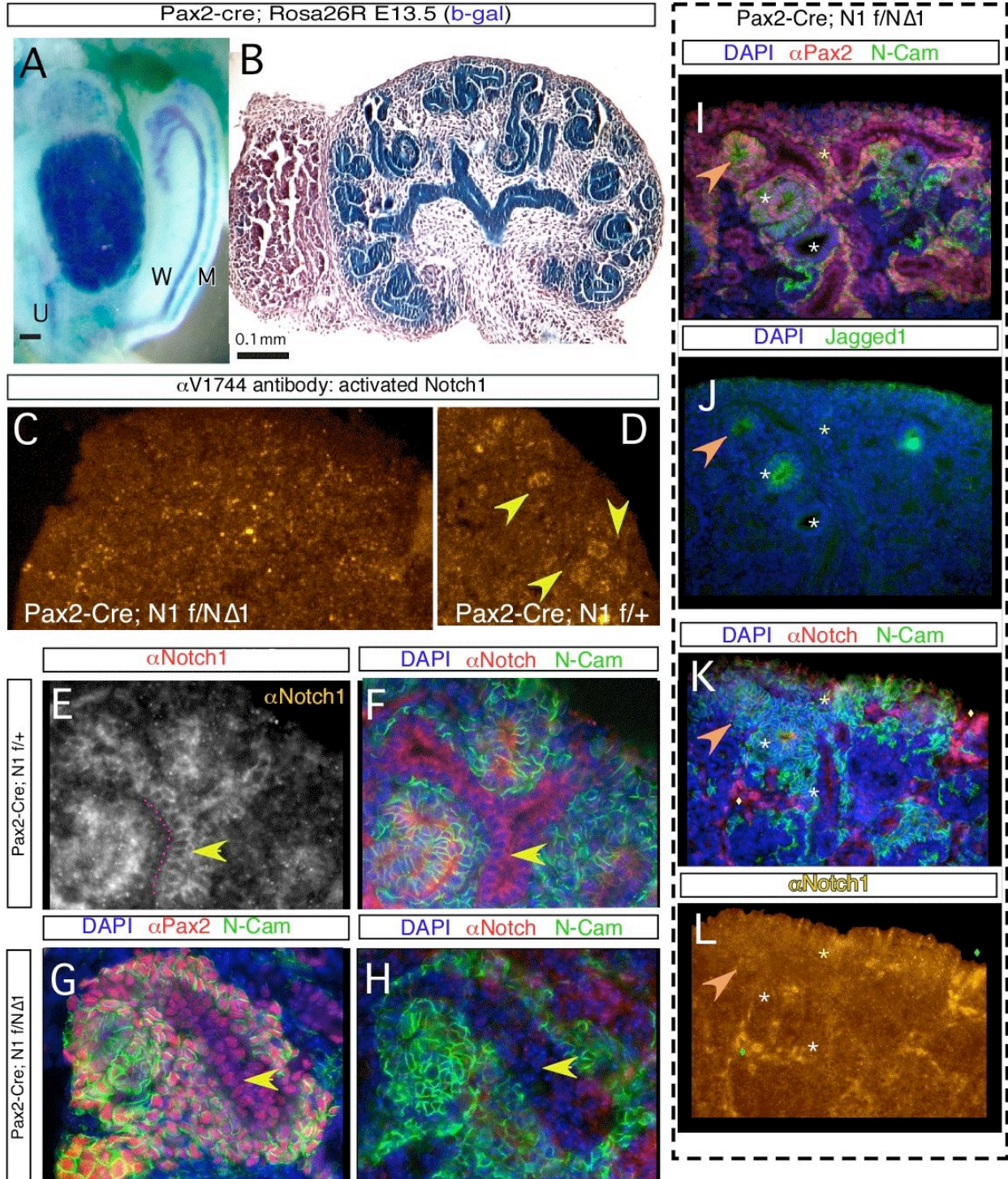


Fig. S4:

