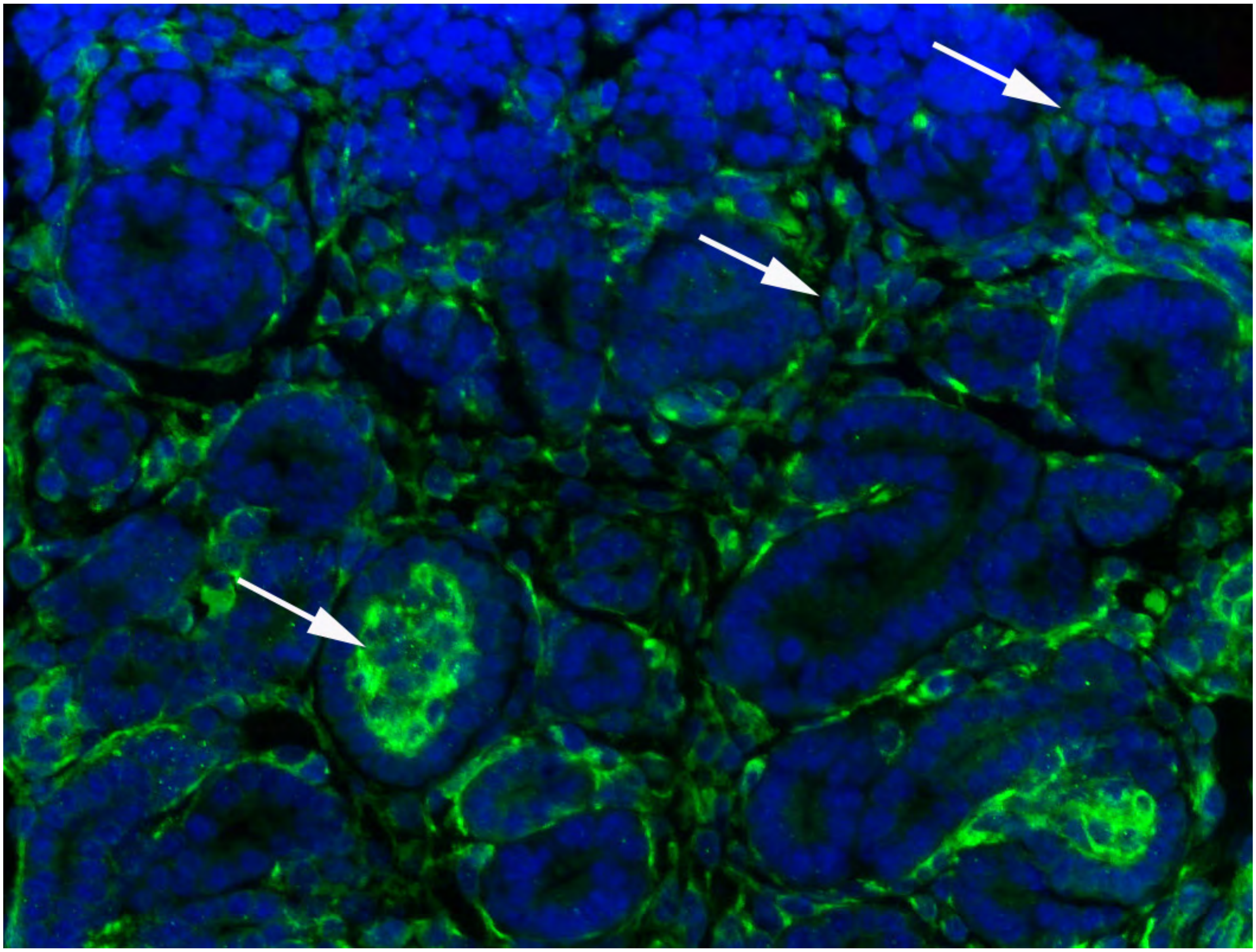


Fig. S1. Anxa2 marks the stromal compartment. Anxa2 immunostain in green, and DAPI in blue. E15.5 kidney. Arrows, from top to bottom, show stromal progenitors, stromal cells and cells of the glomerulus, likely representing mesangial cells, which are derived from a stromal lineage.

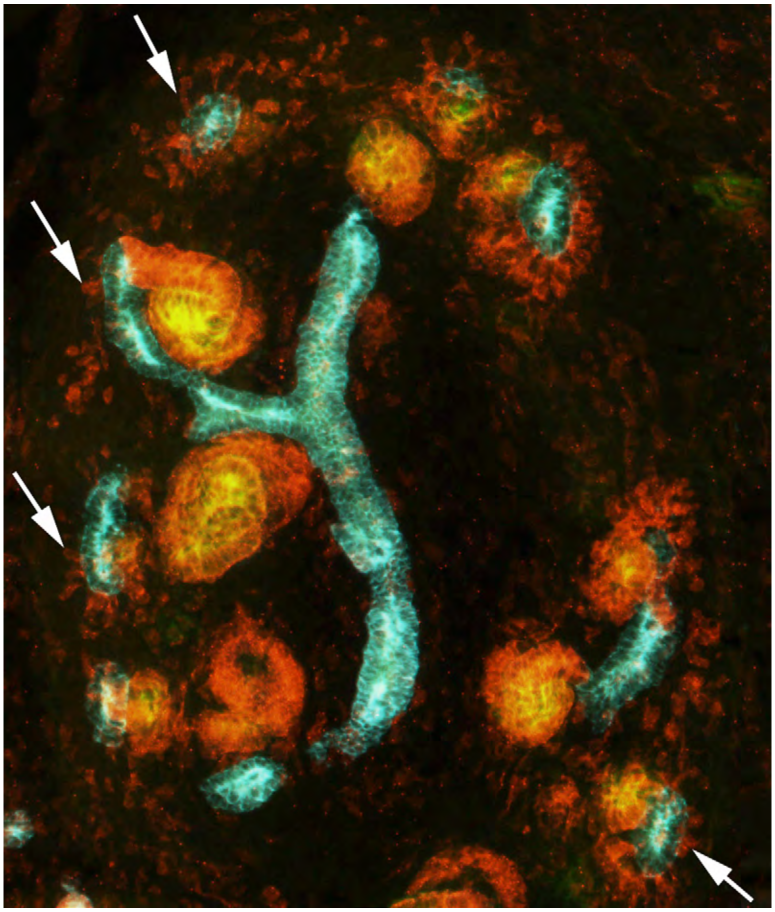


Fig. S2. Wnt4-Cre labels a broad domain of CM cells. *Wnt4-Cre* mice were mated to Rosa26-GFP reporter mice and resulting kidneys stained for GFP (Texas Red), UB specific E-cadherin (green) and Jagged, a marker of developing nephrons (yellow). Arrows show cells marked by *Wnt4-Cre* that are located above UB, in regions of uninduced CM.

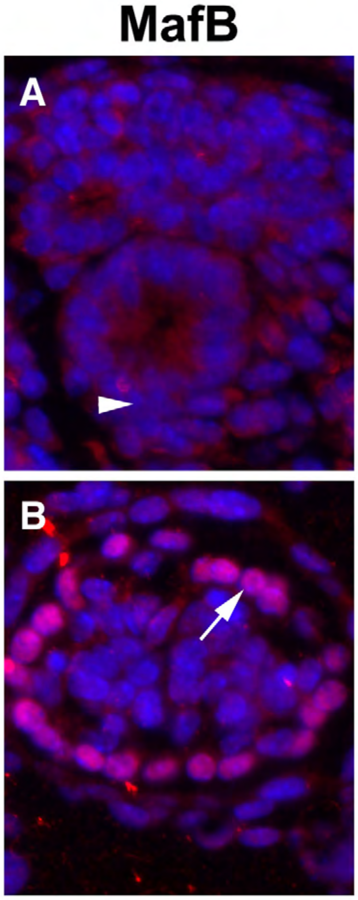
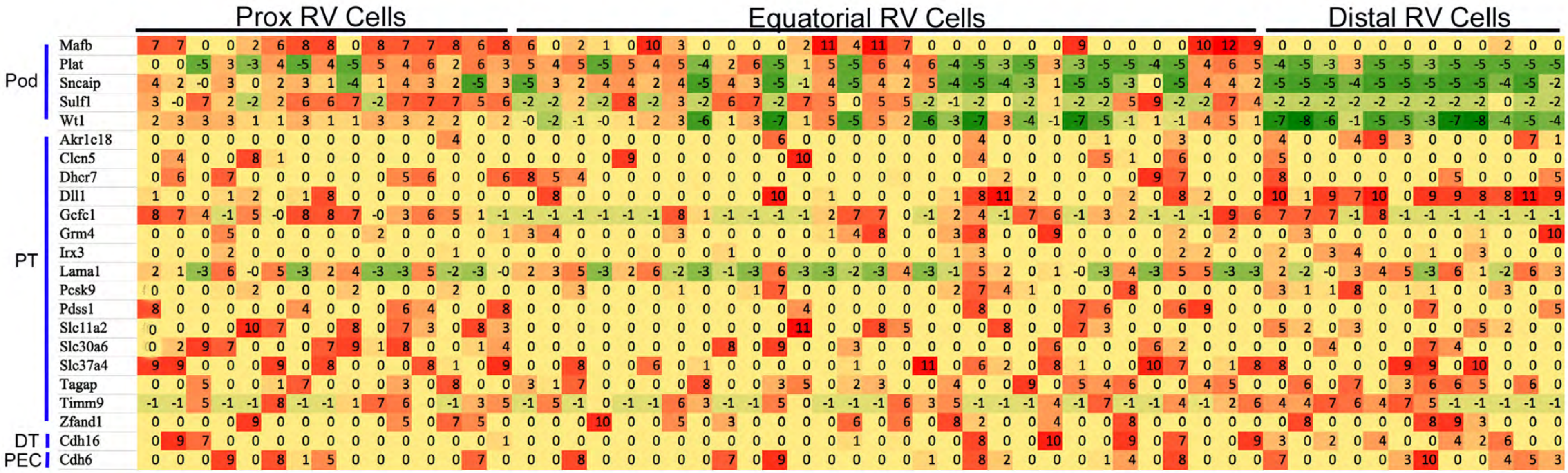


Fig. S3. Renal vesicles show absence of Mafb protein. A. Immunostain showed an absence lf Mafb protein in the renal vesicles (arrowhead). B. The forming glomerulus showed Mafb expression, as expected, in the presumptive podocytes (arrow). DAPI, blue. Mafb immunostain, purple.



		Prox RV Cells														
Pod	Mafb	7	7	0	0	2	6	8	8	0	8	7	7	8	6	8
	Plat	0	0	-5	3	-3	4	-5	4	-5	5	4	6	2	6	3
	Sncaip	4	2	-0	3	0	2	3	1	-4	1	4	3	2	-5	3
	Sulf1	3	-0	7	2	-2	2	6	6	7	-2	7	7	7	5	6
	Wt1	2	3	3	3	1	1	3	1	1	3	3	2	2	0	2
PT	Akr1c18	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
	Clcn5	0	4	0	0	8	1	0	0	0	0	0	0	0	0	0
	Dhcr7	0	6	0	7	0	0	0	0	0	0	5	6	0	0	6
	Dll1	1	0	0	1	2	0	1	8	0	0	0	0	0	0	0
	Gcfc1	8	7	4	-1	5	-0	8	8	7	-0	3	6	5	1	-1
	Grm4	0	0	0	5	0	0	0	0	0	2	0	0	0	0	1
	Irx3	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0
	Lama1	2	1	-3	6	-0	5	-3	2	4	-3	-3	5	-2	-3	-0
	Pcsk9	0	0	0	0	2	0	0	0	2	0	0	0	2	0	0
	Pdss1	8	0	0	0	0	0	4	0	0	0	6	4	0	0	8
	Slc11a2	0	0	0	0	10	7	0	0	8	0	7	3	0	8	3
	Slc30a6	0	2	9	7	0	0	0	7	9	1	8	0	0	1	4
	Slc37a4	9	9	0	0	0	9	0	8	0	0	0	8	1	0	9
	Tagap	0	0	5	0	0	1	7	0	0	0	3	0	8	0	0
	Timm9	-1	-1	5	-1	-1	8	-1	-1	1	7	6	0	-1	3	5
	Zfand1	0	0	0	0	9	0	0	0	0	0	5	0	7	5	0
DT	Cdh16	0	9	7	0	0	0	0	0	0	0	0	0	0	0	1
PEC	Cdh6	0	0	0	9	0	8	1	5	0	0	0	0	0	7	0

		Equatorial RV Cells																													
Pod	Mafb	6	0	2	1	0	10	3	0	0	0	0	2	11	4	11	7	0	0	0	0	0	0	9	0	0	0	0	10	12	9
	Plat	5	4	5	-5	5	4	5	-4	2	6	-5	1	5	-5	6	4	6	-4	-5	-3	-5	3	-3	-5	-5	-4	-5	4	6	5
	Sncaip	-5	3	2	4	4	2	4	-5	4	3	-5	-1	4	-5	4	2	5	-4	-5	-4	-3	1	-5	-5	-3	0	-5	4	4	2
	Sulf1	-2	-2	2	-2	8	-2	3	-2	6	7	-2	7	5	0	5	5	-2	-1	-2	0	-2	1	-2	-2	5	9	-2	-2	7	4
	Wt1	-0	-2	-1	-0	1	2	3	-6	1	3	-7	1	5	-5	5	2	-6	-3	-7	3	-4	-1	-7	-5	-1	1	-1	4	5	1
PT	Akr1c18	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	4	0	0	0	0	1	0	0	3	0	0	0
	Clcn5	0	0	0	0	9	0	0	0	0	0	0	10	0	0	0	0	0	0	4	0	0	0	0	5	1	0	6	0	0	0
	Dhcr7	8	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	9	7	0	0	0
	Dll1	0	8	0	0	0	0	0	0	0	0	10	0	1	0	0	0	0	1	8	11	2	0	0	0	2	0	8	2	0	0
	Gcfc1	-1	-1	-1	-1	-1	-1	8	1	-1	-1	-1	-1	2	7	7	0	-1	2	4	-1	7	6	-1	3	2	-1	-1	-1	9	6
	Grm4	3	4	0	0	0	0	3	0	0	0	0	0	1	4	8	0	0	3	8	0	0	9	0	0	0	0	2	0	2	0
	Irx3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	2	2	0	0
	Lama1	2	3	5	-3	2	6	-2	-3	-1	-3	6	-3	-3	-2	-3	4	-3	-1	5	2	0	1	-0	-3	4	-3	5	5	-3	-3
	Pcsk9	0	0	3	0	0	0	1	0	0	1	7	0	0	0	0	0	0	2	7	4	1	0	0	0	8	0	0	0	0	0
	Pdss1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	8	0	0	0	7	6	0	0	6	9	0	0
	Slc11a2	0	0	0	0	0	0	0	0	0	0	0	11	0	0	8	5	0	0	0	8	0	0	7	3	0	0	0	0	0	0
	Slc30a6	0	0	0	0	0	0	0	0	8	0	9	0	0	3	0	0	0	0	0	0	0	6	0	0	0	6	2	0	0	0
	Slc37a4	0	0	8	0	0	6	0	1	0	0	0	0	0	1	0	0	11	0	6	2	0	8	1	0	0	10	7	0	1	8
	Tagap	3	1	7	0	0	0	0	8	0	0	3	5	0	2	3	0	0	4	0	0	9	0	5	4	6	0	0	4	5	0
	Timm9	-1	5	-1	0	-1	-1	6	3	-1	-1	5	0	-1	-1	-1	6	3	5	-1	-1	-1	4	-1	7	-1	-1	4	-1	2	6
	Zfand1	0	0	0	10	0	0	5	0	3	0	0	0	0	6	0	6	0	8	2	0	0	4	0	0	8	0	0	0	0	0
DT	Cdh16	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	8	0	0	10	0	0	9	0	7	0	0	9
PEC	Cdh6	0	0	8	0	0	0	0	0	7	0	9	0	0	0	0	0	1	0	8	2	0	0	0	1	4	0	8	0	0	0

		Distal RV Cells											
Pod	Mafb	0	0	0	0	0	0	0	0	0	2	0	0
	Plat	-4	-5	-3	3	-5	-5	-3	-5	-5	-5	-5	-5
	Sncaip	-5	-5	-5	-4	-5	-5	-5	-5	-5	-4	-5	-2
	Sulf1	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	-2	-2
	Wt1	-7	-8	-6	-1	-5	-5	-3	-7	-8	-4	-5	-4
PT	Akr1c18	4	0	0	4	9	3	0	0	0	0	7	1
	Clcn5	5	0	0	0	0	0	0	0	0	0	0	0
	Dhcr7	8	0	0	0	0	0	0	5	0	0	0	5
	Dll1	10	1	9	7	10	0	9	9	8	8	11	9
	Gcfc1	7	7	7	-1	8	-1	-1	-1	-1	-1	-1	-1
	Grm4	0	3	0	0	0	0	0	0	1	0	0	10
	Irx3	2	0	3	4	0	0	1	0	3	0	0	0
	Lama1	2	-2	-0	3	4	5	-3	6	1	-2	6	3
	Pcsk9	3	1	1	8	0	1	1	0	0	3	0	0
	Pdss1	0	0	0	0	0	0	7	0	0	0	0	5
	Slc11a2	5	2	0	3	0	0	0	0	5	2	0	0
	Slc30a6	0	0	4	0	0	0	7	4	0	0	0	0
	Slc37a4	8	0	0	0	0	9	9	0	10	0	0	0
	Tagap	0	6	0	7	0	3	6	6	5	0	6	0
	Timm9	4	4	7	6	4	7	5	-1	-1	-1	-1	-1
	Zfand1	0	8	0	0	0	0	8	9	3	0	0	0
DT	Cdh16	3	0	2	0	4	0	0	4	2	6	0	0
PEC	Cdh6	7	0	0	0	0	3	10	0	0	4	5	3

Fig. S4. Multilineage priming of RV cells. Individual RV cells express markers of multiple differentiated cell types. Each column represents an individual cell. Cells are marked as proximal (Prox), equatorial or distal in the RV based on expression of other known proximal/distal markers (see text). Genes normally expressed in differentiated podocytes (Pod), proximal tubules (PT), distal tubules (DT) and parietal epithelial cells (PEC) are shown on the left. Red indicates high expression and green low expression. Numbers represent approximate log, median baseline, normalized expression values.

Table S1. Genes with differential expression in the E11.5 *Foxd1* (stromal), *Six2* only (induced) and *Six2* plus *Cited1* (uninduced metanephric mesenchyme) compartments (single cell/microarray)

Download Table S1

Table S2. Genes with differential expression in E12.5 induced (*Six2* only) versus uninduced (*Six2* and *Cited1*) cap mesenchyme (single cell/RNA-seq)

Download Table S2

Table S3. Genes with differential expression in E12.5 stroma (*Foxd1*) versus cap mesenchyme (*Six2*) (single cell/RNA-seq)

Download Table S3

Table S4. Genes with differential expression in proximal versus distal renal vesicle (single cell/RNA-seq)

Download Table S4