

Supplementary Table 2

	Date	First author	DOI	Fetal/adult	Embryonic week	Part of kidney digested and analysed	Number of individuals/tissues	Number of cells analysed	Methods	Number of clusters	
1	2018	Young	https://doi.org/10.1126/science.aat1699	renal tumor and normal fetal, pediatric and adult	w8,9 Adolescent=12 years	Fetal = kidneys whole dissociation. Adolescent/adult = where possible separate cortical, medullary, pelvic and ureteric biopsies. Otherwise interface of cortex & medulla	2 fetuses, 1 adolescent, 1 adult (and more diseased donors)	Adult kidney: 42,809 nonmalignant cells, 37,951 mature. Fetal kidney: 4858	scRNA seq.	Adult: 19. Fetal: 3 nephron clusters, residual = (myo)fibrobl., endo., gangl. Adolescent: not stated	
2	2018	Menon	https://doi.org/10.1242/dev.164038	fetal	87, 105, 110, 115 and 132 days of gestation	Whole kidney	5	6414	scRNA seq.	11 (8 subclusters within NPCs)	
3	2018	Lindstrom 2	https://doi.org/10.1681/ASN.2017080890	fetal	13 to 18 (for scRNA seq w16)	Nephrogenic zone	5 for conventional RNA seq., 1 for scRNA seq.	scRNA seq: 2750 (318 cells of cluster 4 - NPC)	bulk seq and scRNA seq.	Initially 12, of which 1 cluster NPC related: this divided into 4 clusters (of scRNA seq)	
4	2018	Wang	https://doi.org/10.1016/j.celrep.2018.08.056	fetal	w7, w8, w9, w10, w13, w19, w22, w24, w25	w7-10: whole kidney, w15-25: sections	11 (with 1 biol. Replicate of w7 and w19)	3023 cells of all 11 embryos	scRNA seq.	13	
5	2019	Combes	https://doi.org/10.1186/s13073-019-0615-0	fetal	w16	Did not generate new datasets. Used Lindstrom 2018 dataset and re-analyzed and compared with organoids.	nephrogenic zone of 2 fetuses	N/A. reanalyzing scRNA seq. data	N/A. reanalyzing scRNA seq. data	16	
6	2020	Lindstrom (preprint)	https://doi.org/10.1101/2020.04.27.060749	fetal	week 14	Nephrogenic zone	2	24,254 cells (mean of 2644 genes/cell)	scRNAseq.	18	
7	2019	Stewart	https://doi.org/10.1126/science.aat5031	fetal + adult	7-16 PCW	Fetal = whole kidney. Adult = healthy tissue from tumour nephrectomy and healthy donor tissue (cortex, medulla, pelvis, ureter)	unknown	40,268 (adult), 27,203 (fetal)	high-throughput scRNAseq, bulk RNA seq	Adult = 25, fetal = 21	
8	2019	Tran	https://doi.org/10.1016/j.devcel.2019.06.001	fetal	week 15 and 17 LMP	Vibratome sections, dissected into inner and outer cortex	2	week 17: 7,518 of zone 1 and 2 together. Week 15: 6,129 of zone 1 and 2 together	scRNA seq.	21	
9	2019	Hochane	https://doi.org/10.1371/journal.pbio.3000152	fetal	w9, w11, w13, w16, w18	Whole kidney	one kidney per gestational week	wk 16 = 6,602/ w9+w11+w13+w18 = 11,359	scRNA seq.	22 (29 original clusters, similar ones were merged)	
10	2018	Lindstrom 1	https://doi.org/10.1016/j.devcel.2018.05.010	fetal	w8 to 18 (but two replicates of week 17 for scRNA seq)	Nephrogenic zone	nephrogenic zone of 2 fetuses	7343 cells with 3367 cells of nephrogenic lineage	scRNA seq.	22	
11	2020	Liao	https://doi.org/10.1038/s41597-019-0351-8	adult	x	Whole kidney sections (0.5-1g) from nephrectomy (healthy tissues next to tumor)	3	23,366 (of 3 donors together)	scRNA seq.	10	
12	2018	Wu 2	https://doi.org/10.1681/ASN.2018020125	adult	x	Allograft biopsy	single healthy kidney biopsies	4	4259 nuclei, 4487 cells	scRNA seq.	16
13	2018	Wu 1	https://doi.org/10.1016/j.stem.2018.10.010	adult	x	Cortex of nephrectomy	one kidney	4,524 nuclei	snRNA seq.	17	

14	2017	Sivakamasundari (preprint)	http://dx.doi.org/10.1101/238063	adult	x	Kidney resection samples	3	22,469 (initially 3,128, then 19,341 from two donors used for further analysis)	scRNAseq	27
15	2020	Kuppe	https://doi.org/10.1038/s41586-020-2941-1	adult	x	Healthy tumor nephrectomy tissue	11 (of which 7 with GFR>60)	53,672 cells	scRNAseq, bulk RNA seq, ATAC seq.	50
16	2019	Lake	https://doi.org/10.1038/s41467-019-10861-2	adult	x	Nephrectomy samples, partly containing both cortex and medulla	15	17,659 nuclei	snRNA seq.	30

Supplementary Table 3

CELL TYPE	Hochane fetal	Wang fetal	Lindstrom1 fetal	Lindstrom2 fetal	Young fetal	Stewart fetal	Menon fetal	Combes fetal	Tran fetal
Cap mesenchyme	N/A	SIX2	N/A	N/A	SIX2 CITED1 PAX2 SIX1	SIX2 ITGA8 MAFB WT1 CITED1 SALL1 PAX2 OSR1 WNT4 BMP7 HOXA11	H19 ITGA8 NCAM1 MEIS2 MAFB NR2F2 EYA1 NTRK2	N/A	N/A
Nephron progenitors	OSR1 SIX1 SIX2 CITED1 EYA1 SALL1 MEOX1 GDNF ETV4 COL2A1 HES1 CRABP2 LEF1 ITGA8 LHX1 WNT4 CCND1	N/A	CHRNA1 SLC15A1 DAPL1 TMEM100 MEOX1 CITED1 CRABP2 PDK4 WASF3 MALAT1	CITED1 SIX1 LYPD DAPL1	N/A	N/A	N/A	N/A	TMEM100 CITED1 MEOX1

Pretubular aggregate		N/A	N/A	N/A	N/A	N/A	EYA1 JAG1 CCND1 LHX1 EMX2	N/A	N/A
Committed/primed nephron progenitor	N/A	N/A	ID3 HEY1 LYPD1 ID1 PAX2 ID2	ID1 MEG3 DAPL1	N/A	N/A	N/A	N/A	MAL CLDN10 HES1
Proliferating nephron progenitor	N/A	N/A	HIST1H2AC IGFBP5 MFAP4	CENPF TOP2A	N/A	N/A	N/A	N/A	TOP2A SIX1 TMEM100
Proliferating committed nephron progenitor	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	PCNA LHX1 PAX2
Self-renewing NPC	N/A	N/A	N/A	TMEM100 CITED1 ROBO2 MEOX1	N/A	N/A	N/A	N/A	N/A
Differentiating NPC	N/A	N/A	N/A	CCND1 PAX8 LHX1	N/A	N/A	N/A	N/A	N/A

Renal vesicle & comma-shaped body	LHX1 PAX8 JAG1 PAX2 WNT4 SFRP2 DLL1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Proximal renal vesicle	N/A	N/A	N/A	N/A	N/A	MAFB WT1 PAX2 FOXC2 TMEM100 LMX1B NPHS1 NPHS2 JAG1 PAX8 NOTCH2	N/A	N/A	N/A
Distal renal vesicle	N/A	N/A	N/A	N/A	N/A	LHX1 DLL1 DKK1 FGF8	N/A	N/A	N/A
Renal vesicle	N/A	N/A	N/A	N/A	PTPRO PODXL WT1	N/A	LHX1 EMX2 JAG1 DKK1 IGFBP4 CCND1	N/A	N/A

PTA/RV	N/A	N/A	GAD2 CCND1 KRT8 PAX8 CXCR4 LHX1 EMX2	N/A	N/A	N/A	N/A	N/A	N/A
S-shaped body	N/A	N/A	N/A	N/A	N/A	N/A	JAG1 CCND1 LHX1 ADAMTS1 POU3F3 EMX2 SIM2 DKK1 EPHA7 EPHA4 PLEKHA1	N/A	N/A
S-shaped body, medial and distal segments	HNF1B POU3F3 SIM2 SOX9 IRX2 IRX3	N/A	N/A	N/A	N/A	IRX1 IRX2 HNF1B POU3F3 JAG1 CCND1	N/A	N/A	N/A
S-shaped body, proximal segment	CDH6 HNF1A AMN	N/A	N/A	N/A	N/A	MAFB WT1 FOXC2 TMEM100 LMX1B	N/A	N/A	N/A

Parietal epithelial cells	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	LIX1 CLDN1 CDH6
Loop of Henle	N/A	UMOD POU3F3	N/A	N/A	N/A	N/A	SLC3A1 CLDN10 KCNJ1 ATP1B1 FXD2 EPA7 TBC1D4 POU3F3 MECOM	N/A	N/A
(Thick) ascending limb	N/A	N/A	N/A	N/A	CLDN16	CLDN16 UMOD	N/A	N/A	N/A
Descending limb	N/A	N/A	N/A	N/A	SLC12A1	SLC12A1	N/A	N/A	N/A
Distal tubule & loop of Henle	PAPPA2 MAL CLCN5 SLC12A3 UMOD SLC12A1	N/A	FXD2 SLC12A1 MAL ALDH1A1	N/A	N/A	N/A	SLC12A1 UMOD CLCNKB MECOM POU3F3 DEFB1 (human)	N/A	N/A
Distal tubule	N/A	CLCNKB	N/A	N/A	AVPR2 SLC8A1 KCNJ1	SLC12A3	FXD2 CA2 MAL TBC1D4 DEFB1 (human) POU3F3 MECOM	N/A	N/A
Distal precursor	N/A	N/A	LIMCH1 MECOM MAL SOX9	N/A	N/A	N/A	N/A	N/A	N/A

Early proximal tubule	LRP2 ANPEP SLC34A1 CLDN1 CLDN2 SLC13A1 CUBN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Proximal precursor	N/A	N/A	IGFB7 JAG1 CDH6 TPSAN12	N/A	N/A	N/A	N/A	N/A	N/A
Proximal tubule	N/A	LRP2 CUBN	C19orf77 CUBN SLC3A1 GLYATL1	N/A	SLC13A3 SLC34A1	FAM151A SLC22A8 ALDOB GLYAT SLC13A1 DPEP1 HNF1A HNF4A HNF4G SLC5A2	SLC3A1 CUBN PDZK1 LRP2 CA2 FXVD2 ATP1B1 ADAMTS1	N/A	SLC3A1 LGALS2 APOA1
Distinct proximal tubule	N/A	N/A	N/A	N/A	N/A	VACM1	N/A	N/A	N/A
Proximal straight tubule	N/A	N/A	N/A	N/A	SLC7A13 SLC16A9 SLC22A7	N/A	N/A	N/A	N/A
Proximal distal tubule	N/A	N/A	N/A	N/A	SLC17A3 SLC22A8	N/A	N/A	N/A	N/A
Connecting tubule	ALDH1A1 TACSTD2 CDH1	N/A	N/A	N/A	N/A	CALB1	ATP6V1B1 FXVD2 MECOM TBC1D4 PLEKHA1	N/A	N/A

Interstitial progenitor cells	GDNF FOXD1	N/A	N/A	N/A	N/A	FOXD1 PBX1 PDGFRA	N/A	N/A	N/A
Proliferating interstitial cells	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TOP2A COL1A2 PCNA
Interstitial cells	DES COL3A1 COL1A1 SERPINE2 FGF7 DCN LEF1	SFRP1 MEIS1 PDGFRA	N/A	SULTEI1 TCF21 ALDH1A2 VCAM1 FABP2 ANGPT1 LUM SFRP2 DCN MEIS1 TAGLN POSTN REN MGP GATA3	N/A	N/A	COL1A2 COL3A1 TNC COL6A3 LGALS1 MAFB NR2F2 IGFBP4	N/A	COL1A2 PDGFRA COL1A1 SULT1E1 OLFM3 ANGPT1 PBX1 MEIS2 COL8A1 GUCY1A3 TGFB1 ZEB2
Fibroblast	N/A	N/A	N/A	N/A	SFRP2 EMILIN1 MMP2	LUM TNC COL1A1 COL3A1 COL1A2 COL1A1	N/A	N/A	N/A
Myofibroblast	N/A	N/A	N/A	N/A	PDGFRB ACTA2	PDGFRB	N/A	N/A	N/A
Mesangial cells	ACTA2 TPM2 PDGFRB MCAM CSPG4 CD248	N/A	N/A	N/A	N/A	N/A	LGALS1	N/A	TMEFF1 GATA3 COL4A1

Collecting duct & Ureteric Bud	KRT18 KRT8 RET CLDN7 AQP2 GATA2 MMP7 CALB1	QP2 AQP3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Uteric bud	N/A	N/A	N/A	N/A	RET GATA3 ELF3 POU3F3 TFCP2L1 CDH16	HNF1B GATA3 RET WNT9B SOX8 SOX9 GFRA1 WNT11 ELF3 POU3F3 TCFP2L1 CDH16 KRT8 KRT19	N/A	N/A	ALDH1A1 RET CRABP1
Collecting duct	N/A	N/A	N/A	N/A	ATP6V0D2 CLCNKB CLDN8	PVALB CLNK TMEM213 CLCNKA CLCNKB KRT8 KRT19	KCNJ1 GATA3 ELF5 STC1 TBX3 CLDN4 ATP6V1B1 MAL POU3F3 TBC1D4 KNG1 (rat) CA2 DEFB1 (human) PLEKHA1	N/A	KRT18 AQP2 CALB1
Intermedullary collecting duct	N/A	N/A	N/A	N/A	N/A	SLC14A2	N/A	N/A	N/A

Intercalated cells	N/A	N/A	N/A	N/A	N/A	FOXI1	TMEM213 (human)	N/A	N/A
Intercalated cell type A	N/A	N/A	N/A	N/A	SLC4A1	N/A	SLC4A1	N/A	N/A
Intercalated cell type B	N/A	N/A	N/A	N/A	SLC26A4	N/A	SLC26A4	N/A	N/A
Principal cells	N/A	N/A	N/A	N/A	AQP2	AQP2 AQP3	N/A	N/A	N/A
Macula densa	N/A	N/A	N/A	N/A	N/A	PTGS2	N/A	N/A	N/A
Pelvic epithelium	N/A	N/A	N/A	N/A	KRT23 SAA2	SAA2	N/A	N/A	N/A
Transitional epithelium of ureter (urothelium)	N/A	N/A	N/A	N/A	N/A	UPK1A UPK1B	N/A	N/A	N/A
Pelvis & ureter	N/A	N/A	N/A	N/A	TP63 PVRL4 KRT5 UPK1B UPK1A DHRS2 S100P	UPK3A S100P DHRS2	N/A	N/A	N/A
Endothelial cells	KDR TEK FLT1 CDH5 PECAM1	N/A	N/A	PLVAP GNG11 TIE1	N/A	PECAM1	ADGRL4 ADGRF5 NOSTRIN PECAM1 CD34	N/A	PLVAP VAMP5 EMCN
Fenestrated endothelium	N/A	N/A	N/A	N/A	N/A	PLVAP	N/A	N/A	N/A
Non-fenestrated vasa recta	N/A	N/A	N/A	N/A	N/A	SLC14A1	N/A	N/A	N/A
Glomerular vasculature	N/A	N/A	N/A	N/A	CLDN5 SEMA3G AQP1	N/A	N/A	N/A	N/A

Vascular	N/A	N/A	N/A	N/A	PLVAP SLC14A1 VCAM1 KDR PTPRB PECAM1	N/A	N/A	N/A	N/A
Leukocytes	CD37 CD48 ITGB2 IFI30 IL1B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Immune cells	N/A	N/A	N/A	HLA-DRA CCLN3 SRGN	N/A	N/A	N/A	N/A	LYZ PTPRC IL1B
Erythrocytes	N/A	N/A	N/A	N/A	N/A	N/A	MTCO1P12 MTND1P23 RPL10P9 HBG2 HBA2 HEMGN AHSP ALAS2 HBG1 HBB	N/A	HBM HBB HBA1
Hematopoietic cells	N/A	N/A	N/A	N/A	N/A	N/A	LST1 HLA-DPA1 SRGN MINDA CORO1A	N/A	N/A
Blood cells	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Proliferating cell	N/A	N/A	HIST1H4C NUSAP1 KIAA0101 UBE2C CENPF	HIST1H4C HIST1H1A	N/A	N/A	HIST1H1A HIST1H1B HIST1H1C HIST1H1D HIST1H1E	N/A	N/A

