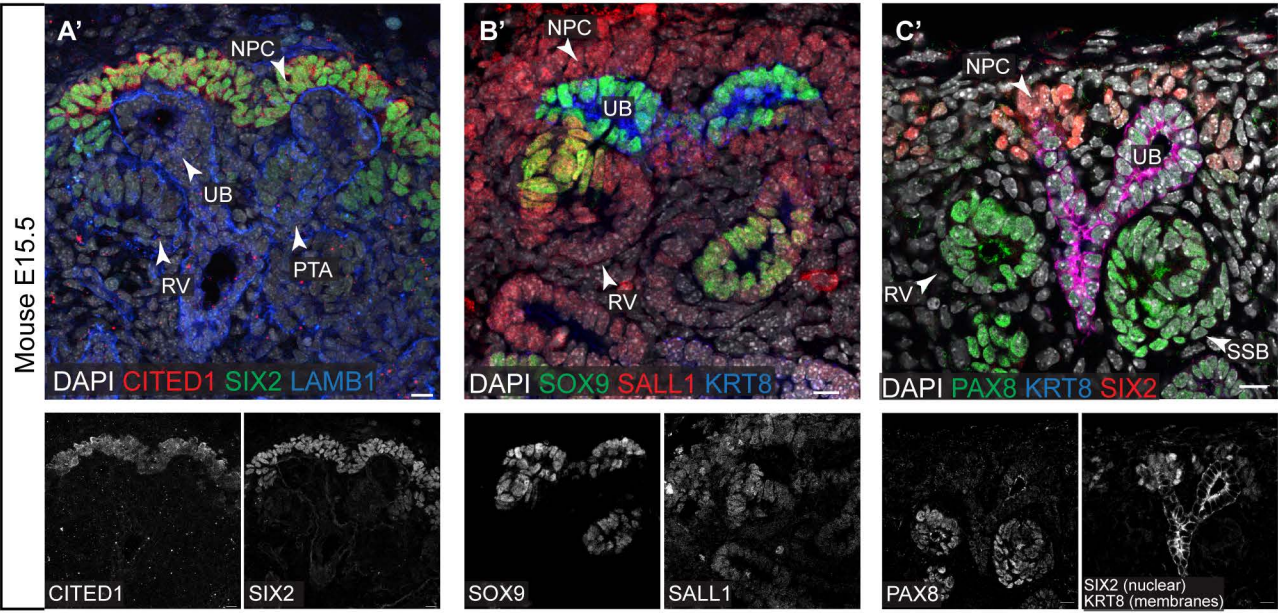
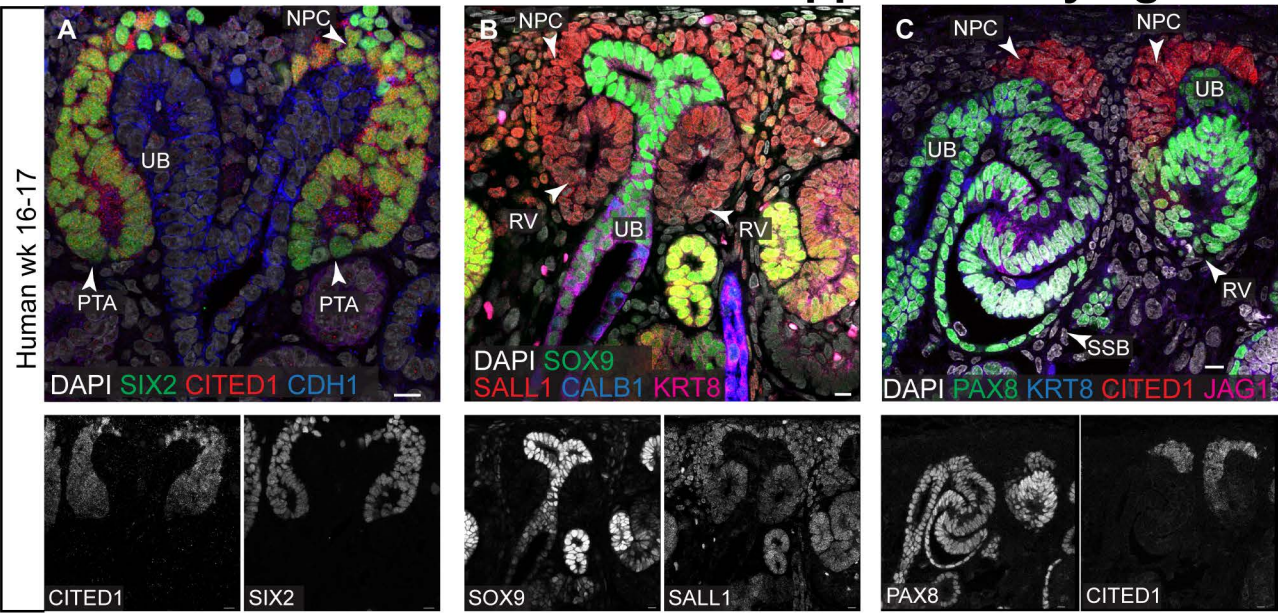
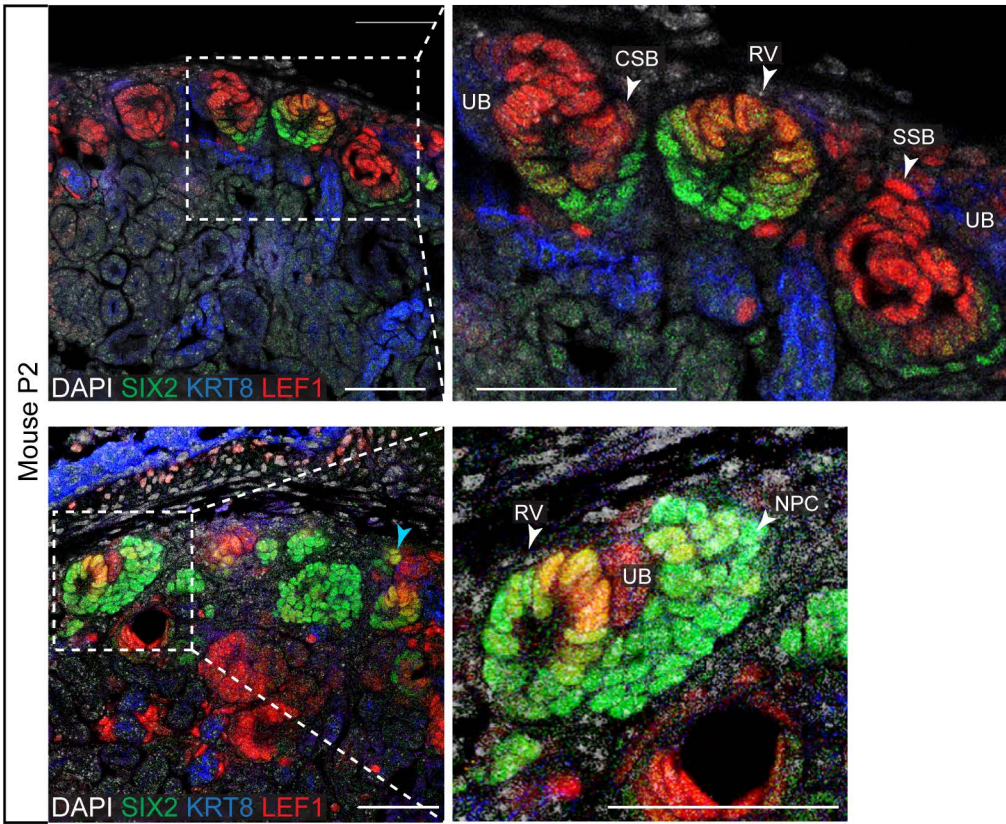


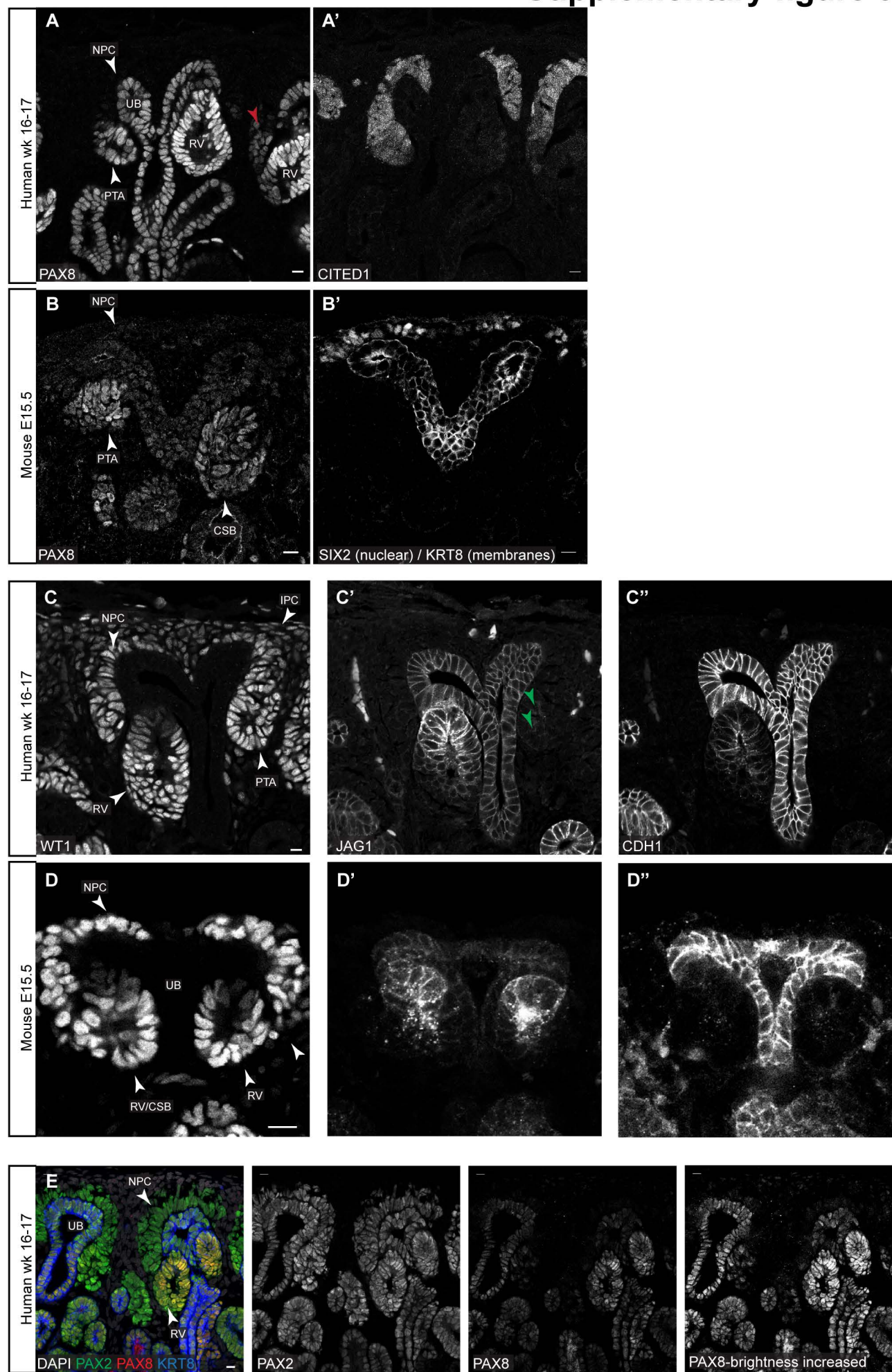
Supplementary figure 1



Supplementary figure 2



Supplementary figure 3



Expression and localization patterns for antibodies and *in situ* hybridization performed in study

Gene symbol	Gene name	Protein type	Kidney phenotype/disease		Cap mesenchyme		Renal vesicle		S-shaped body nephron		Reference
			Mouse	Human	Mouse	Human	Mouse	Human	Mouse	Human	
CDH1	Cadherin 1	Cell-adhesion protein	-	-	-	-	+	+	+	+	Vestweber et al., 1985
CITED1	Cbp/p300 interacting transactivator with Glu/Asp-rich carboxyterminal domain 1	Transcription factor	-	-	+	+	-	-	-	-	Boyle et al., 2007
FOXC2	Forkhead box C2	Transcription factor	+	+	+	+	+	+	+	+	Takemoto et al., 2006
GATA3	Gata binding protein 3	Transcription factor	+	+	-	-	-	-	-	+	Grote et al., 2008
HES1	Hairy/enhancer of split homolog 1	Transcription factor	-	-	+	+	+	+	+	+	Chen et al., 2005
HNF1B	Hnf1 homeobox B	Transcription factor	+	+	-	-	+	+	+	+	Heliot et al., 2013
HOXD11	Homeobox d11	Transcription factor	+	-	+	+	?	+	?	+	Wellik et al., 2002
JAG1	Jagged 1	Notch ligand	+	+	-	-	+	+	+	+	Liu et al., 2013
KRT8	Keratin 8	Cell-adhesion protein	-	-	-	-	-	+	-	+	Chen et al., 2005
LEF1	Lymphoidenhancer binding factor 1	Transcription factor	-	-	-	+	+	+	+	+	Mugford et al., 2009
LHX1	Lim homeobox gene 1	Transcription factor	+	-	-	-	+	+	+	+	Kobayashi et al., 2005
MAFB	v-maf musculoaponeurotic fibrosarcoma oncogene family, protein B	Transcription factor	+	-	-	-	+	+	+	+	Moriguchi et al., 2006
PAX2	Paired box 2	Transcription factor	+	+	+	+	+	+	+	+	Bouchard et al., 2002
PAX8	Paired box 8	Transcription factor	+	+	-	-	+	+	+	+	Bouchard et al., 2002
POU3F3	POU domain, class 3, transcription factor 3	Transcription factor	+	-	-	-	+	+	+	+	Nakai et al., 2003
SIX1	Sine oculisrelated homeobox 1	Transcription factor	+	+	-	+	-	+	-	+	Xu et al., 2003
SIX2	Sine oculisrelated homeobox 2	Transcription factor	+	+	+	+	+	+	-	+	Self et al., 2006
SOX9	SRY-box 9	Transcription factor	+	+	-	-	+	+	+	+	Reginensi et al., 2011
WNT4	Wingless-type MMTV integration site family, member 4	Wnt ligand	+	+	-	-	+	+	+	+	Stark et al., 1994
WT1	Wilms' Tumour Protein 1	Transcription factor	+	+	+	+	+	+	+	+	Armstrong et al., 1994

First point of detection for commonly used protein markers of mature tubule segments in the human kidney

Gene symbol	Gene name	Stage first observed	Gudmap ontology number
LRP2	LDL Receptor Related Protein 2	Proximal segment of s-shaped body	27764
SLC3A1	Solute Carrier Family 3 Member 1	Proximal segment of s-shaped body; early proximal tubule	27764 ; 27784
SLC12A1	Solute Carrier Family 12 Member 1	Immature loop of Henle ascending limb	35426
SLC12A3	Solute Carrier Family 12 Member 3	Early distal tubule (after Capillary Loop Stage)	28390
CUBN	Cubilin	Early proximal tubule	27784
PODXL	Podocalyxin Like	Proximal renal vesicle; visceral epithelium of s-shaped body	31549; 27766
WT1		Proximal renal vesicle; visceral epithelium of s-shaped body; proximal segment of s-shaped body	31549; 27766 ; 27764
NPHS2	Podocin	Visceral epithelium of s-shaped body	27766
MAFB		Proximal renal vesicle; visceral epithelium of s-shaped body	31549; 27766
UMOD	Uromodulin	Early distal tubule (after Capillary Loop Stage)	28390
AQP1	Aquaporin 1	Early proximal tubule (after Capillary Loop Stage)	27784