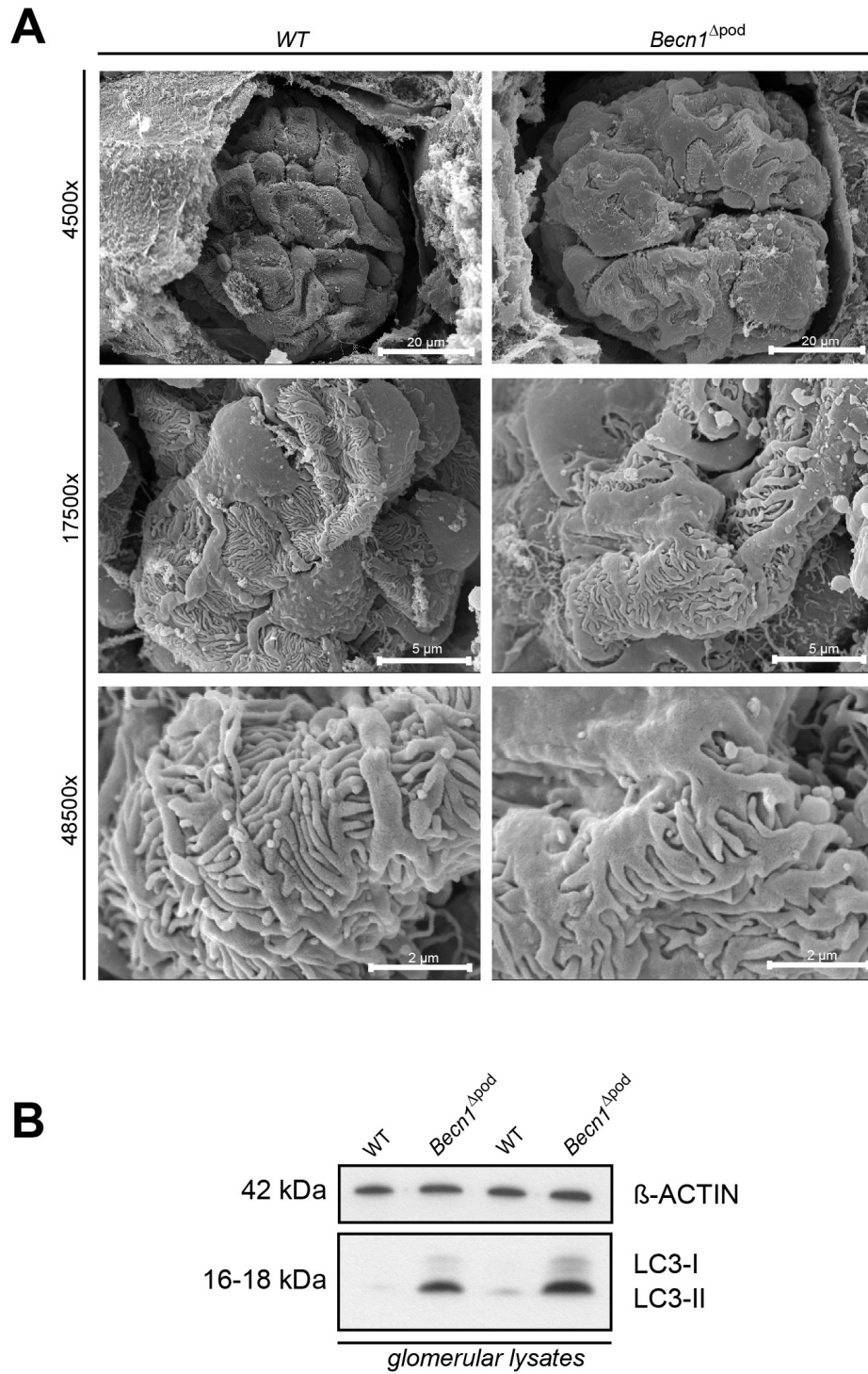
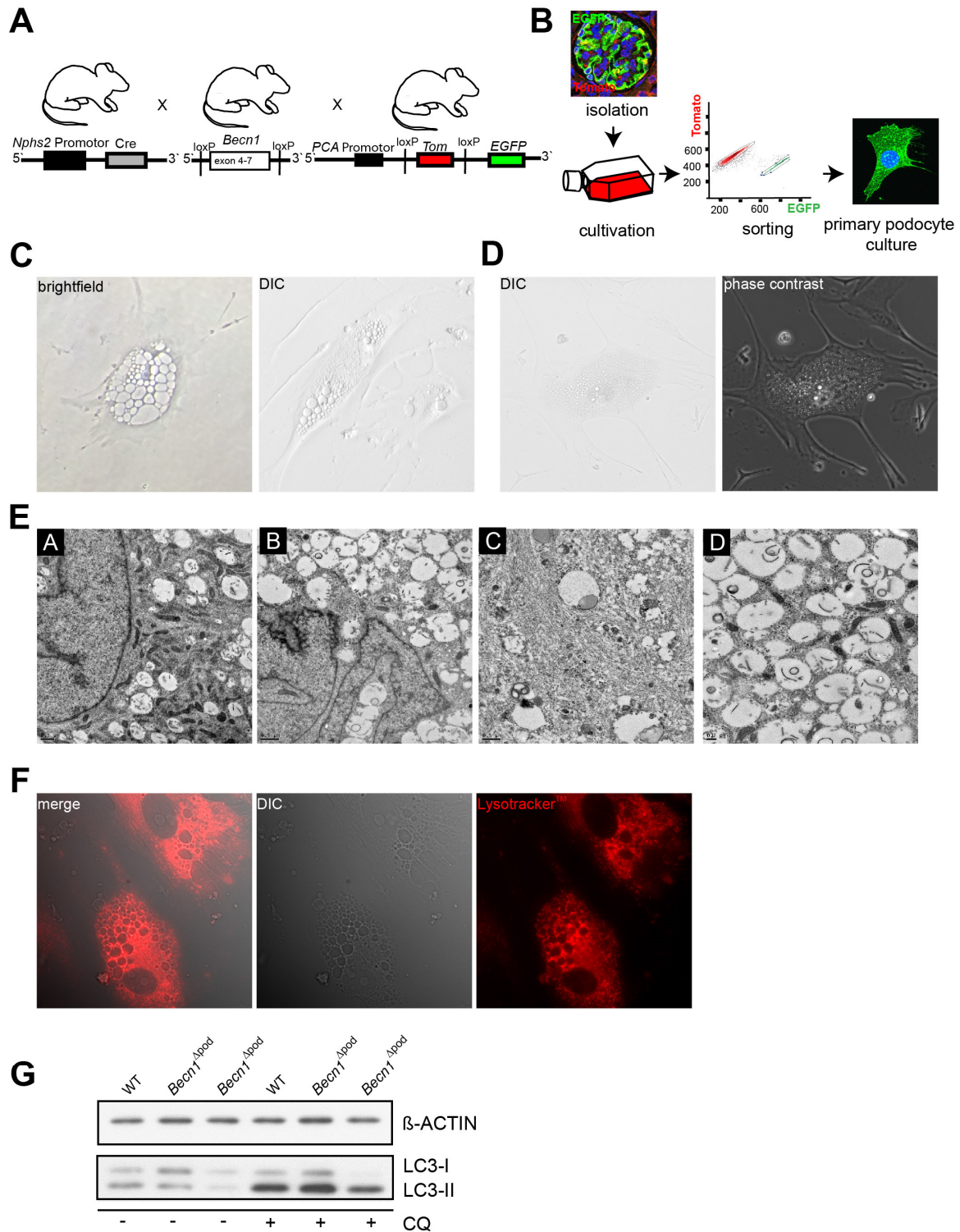


**Figure S1.** (A) Median-centred intensity of BECN1 expression in healthy and diseased kidneys based on Nakawa et al. [12] and obtained from the Nephroseq database; (B) Chronic kidney disease (CKD)-associated upregulation of BECN1 expression in different renal compartments based on Nakawa et al. [12] and obtained from the Nephroseq database; (C) Expression patterns of ATG genes in healthy and diseased kidneys based on Nakawa et al. [12] and obtained from the Nephroseq database.



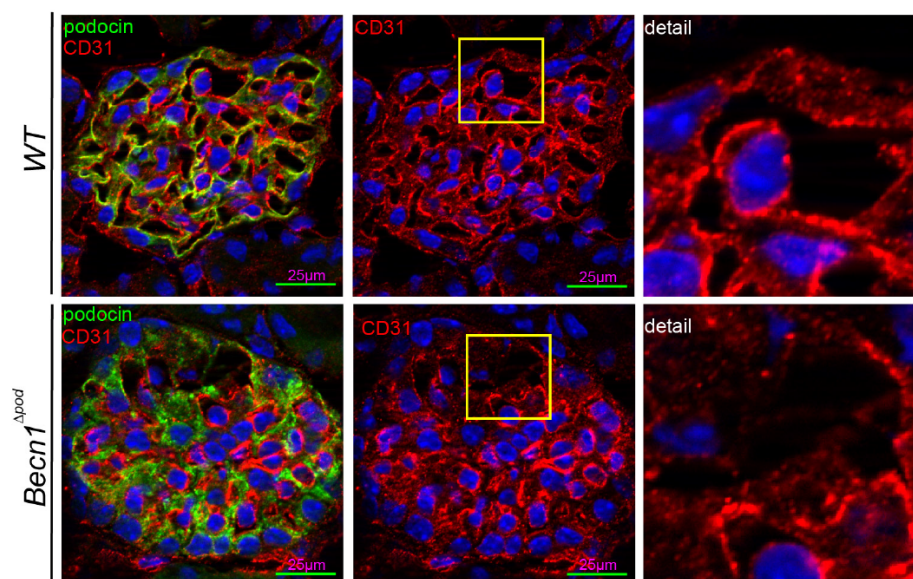
**Figure S2. (A)** Scanning electron microscopy (SEM) images showing kidneys obtained from 4-week-old WT and *Becn1*<sup>flox/flox</sup> × *hNphs2*-Cre mice to visualize foot process formation; **(B)** Western blot showing the abundance of ACTIN and LC3 in lysates obtained from 4-week-old WT and *Becn1*<sup>flox/flox</sup> × *hNphs2*-Cre mice;



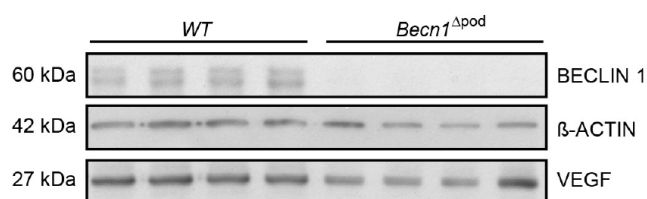
**Figure S3.** Primary podocytes confirmed in vivo findings showing disrupted vesicle trafficking in *Becn1* deficiency. (A) Schematic showing *Becn1*<sup>fl/fl</sup> mice crossed with hNphs2-Cre mice and Tomato/EGFP-reporter mice to obtain EGFP-labelled WT and *Becn1*-deficient podocytes; (B) Schematic showing primary podocyte culture with glomerular isolation and the outgrowth culture. Fluorescence-activated cell counting was performed to achieve a pure primary podocyte culture; (C,D) Primary *Becn1*-deficient podocytes displaying intracellular vesicle accumulation (brightfield (C) and phase contrast (D)); (E) Transmission electron microscopy (TEM) images showing primary *Becn1*-deficient podocytes intracellular vesicles at different magnifications of intracellular vesicle; (F) LysoTracker<sup>TM</sup> staining of primary *Becn1*-deficient podocytes; (G) Western blot

showing the abundance of ACTIN and LC3 in primary immortalized WT and *Becn1*-deficient podocytes with and without chloroquine treatment (100  $\mu$ M for 2 h);

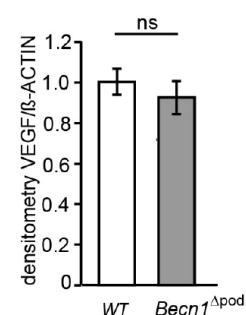
**A**



**B**



**C**



**Figure S4.** Podocyte-specific deletion of *Becn1* leads to endothelial damage in glomeruli. **(A)** Representative image showing immunofluorescence staining for NEPHRIN (green) and CD31 (red) in kidney sections obtained from 4-week-old WT and *Becn1*<sup>Δpod</sup> mice; **(B)** Western blot showing the abundance of BECLIN1, VEGF and ACTIN in glomerular lysates obtained from 4-week-old WT and *Becn1*<sup>Δpod</sup> mice; **(C)** Densitometry data obtained from samples shown in **(B)** (ns: non-significant).