



Supplementary figure 1. Human glomerular ultrafiltration coefficient is high, on account of large surface area for fluid exchange.

A: Glomerular water permeability (ultrafiltration coefficient: $L_P A$) measured in individual glomeruli from healthy wild-type mice (67 glomeruli from 17 mice), healthy rats (134 glomeruli from 25 rats) and non-diabetic kidney donors (25 glomeruli from 3 donors). *B*: Glomerular volume determined in the same glomeruli. *C*: Volume-corrected ultrafiltration coefficient ($L_P A/V_i$) calculated as the quotient of glomerular ultrafiltration coefficient ($L_P A$) and glomerular volume (V_i) for individual glomeruli.

* $p < 0.05$, one-way ANOVA vs other two species, ^{ns} $p > 0.05$, one-way ANOVA for comparisons as indicated.

Clinical details	Creatinine (μmol/L)	Proteinuria (g/L)	Histology	Molecular assays	Functional assay
Normal	62	Neg dipstick	Normal	Y	-
Normal	60	Neg dipstick	Normal	Y	-
Normal	65	Neg dipstick	Normal	Y	-
Normal	184	Neg dipstick	Normal	Y	-
Normal	85	Neg dipstick	Normal	Y	-
Normal	-	*	**	-	Y
Normal	70	*	**	-	Y
Normal	91	*	**	-	Y
Early DN	102	1.1	Nodular glomerulosclerosis, foci of interstitial fibrosis & tubular atrophy	Y	-
Early DN	103	1.54	Mesangial expansion, diffuse glomerulosclerosis	Y	-
Early DN	80	0.5	Early features of diabetic nephropathy	Y	-
Early DN	71	0.44	Mesangial expansion, diffuse glomerulosclerosis, slight tubular atrophy	Y	-
Early DN	***	***	Mesangial expansion, diffuse glomerulosclerosis	Y	-
Early DN	86	*	**	-	Y
Early DN	89	0.06	**	-	Y
Early DN	91	3	**	-	Y
Late DN	122	3.14	Mesangial expansion, nodular glomerulosclerosis, interstitial fibrosis, thickened GBM	Y	-
Late DN	350	>10	Diffuse nodular mesangial matrix expansion, advanced sclerosis, interstitial scarring, thickened GBM	Y	-
Late DN	144	11	Global sclerosis, Kimmelstiel-Wilson nodules, moderate tubular atrophy and interstitial fibrosis	Y	-
Late DN	390	>10	Features of advanced diabetic nephropathy with moderate chronic damage	Y	-
Late DN	298	13	Global sclerosis, Kimmelstiel-Wilson nodules, marked chronic tubulointerstitial fibrosis	Y	-
Late DN	127	2.4	Global sclerosis, nodular mesangial matrix expansion, widespread tubular atrophy and interstitial fibrosis, thickened GBM	Y	-
Late DN	269	5.4	Global mesangial sclerosis with nodularity, widespread tubular atrophy and interstitial fibrosis	Y	-

Supplementary Table 1. Human kidney sample details.

* urinary protein excretion not routinely collected in kidneys offered for transplantation, and therefore quantification not available.

** physiology experiments preclude histology information from the same glomeruli

*** anonymised autopsy specimen: additional clinical details not available