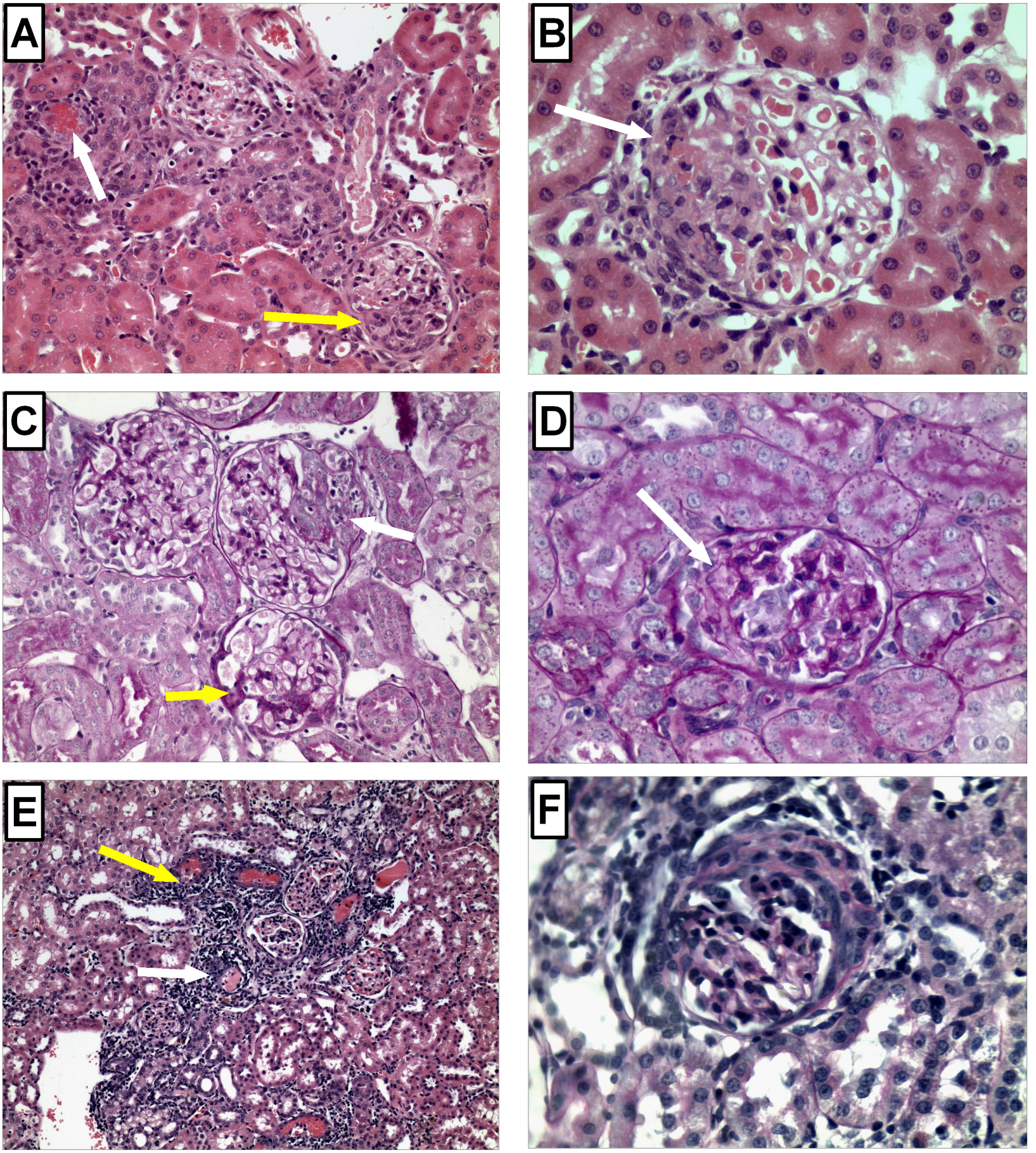
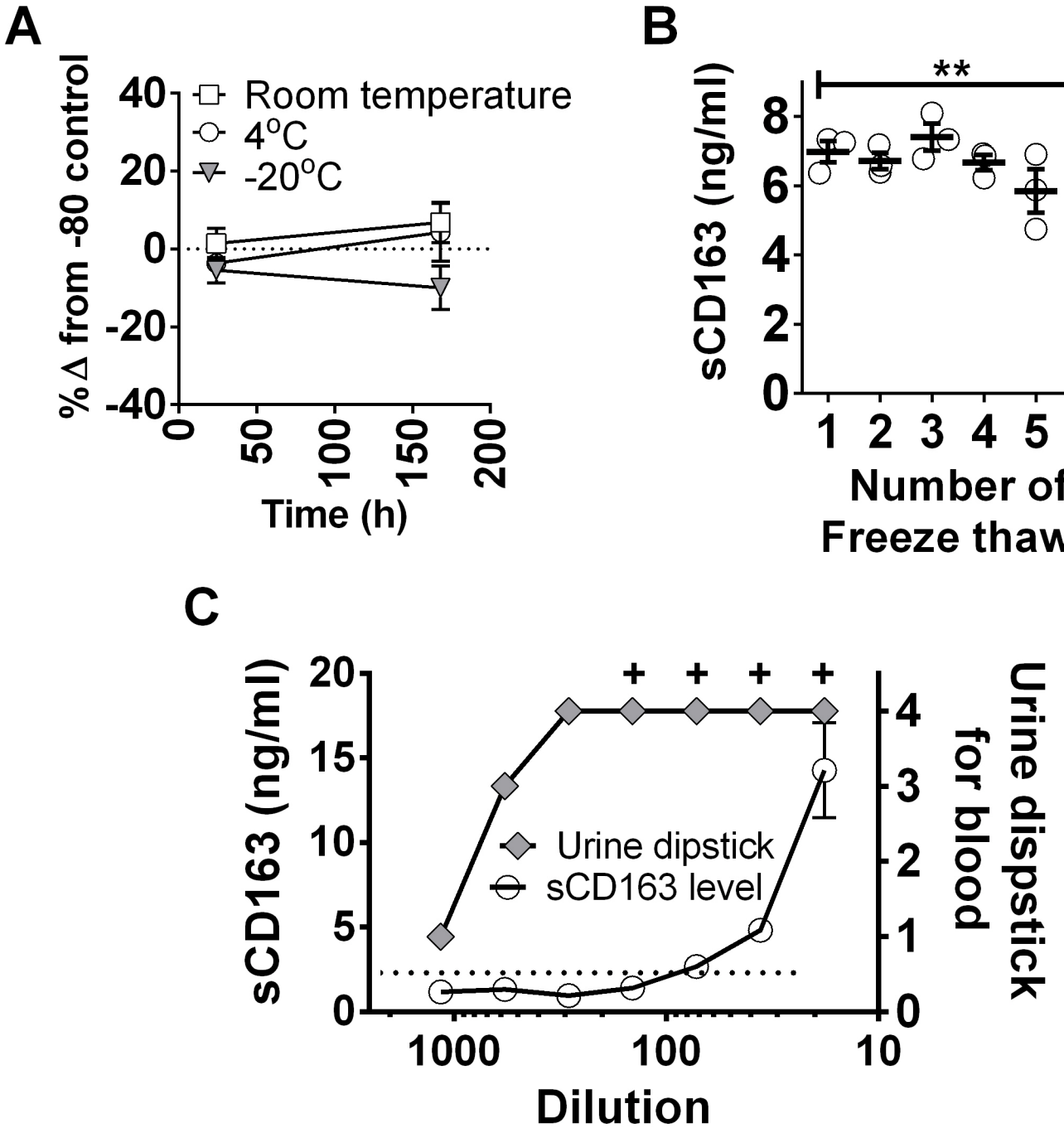
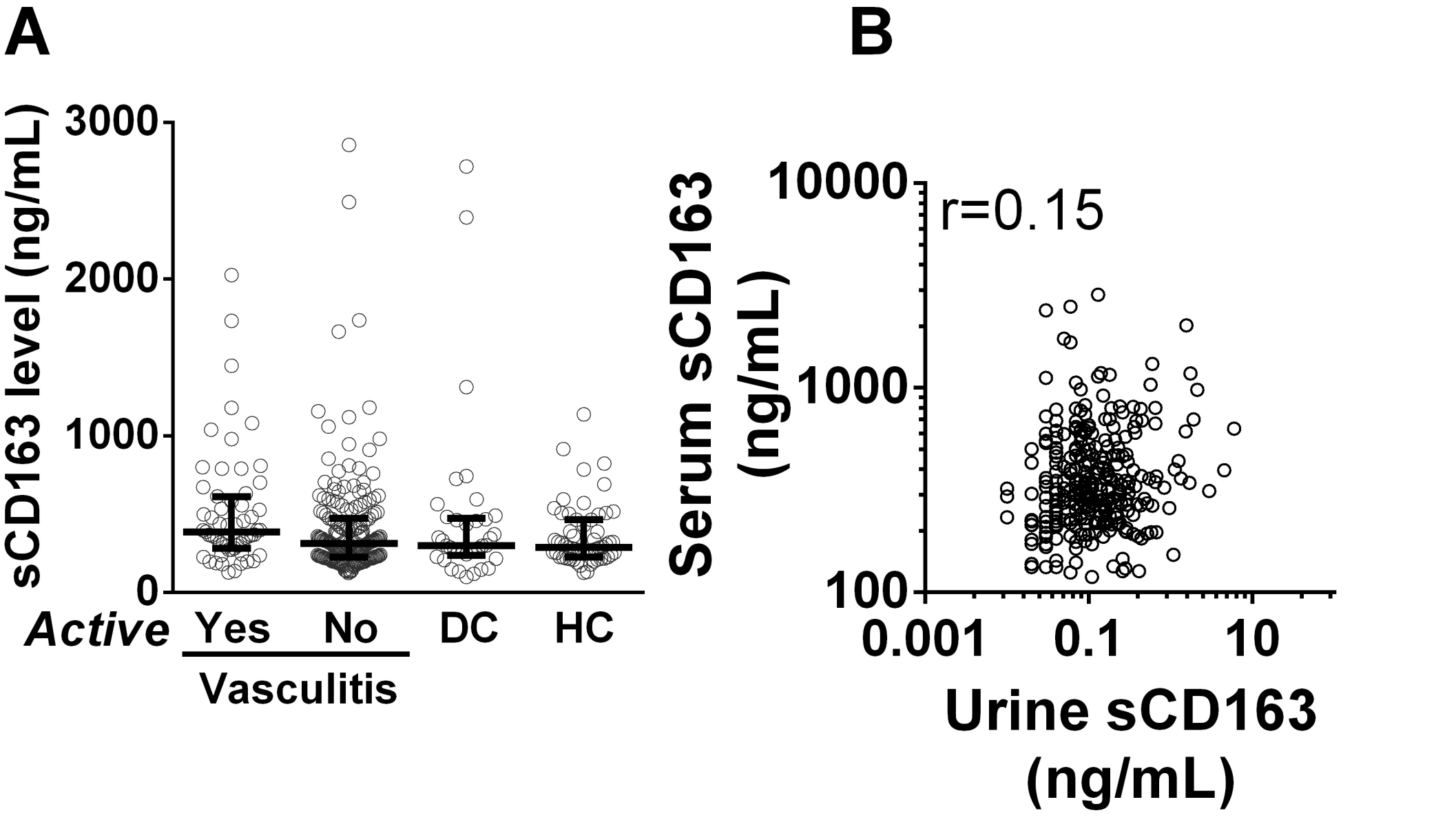

A
B
C
D
E
F

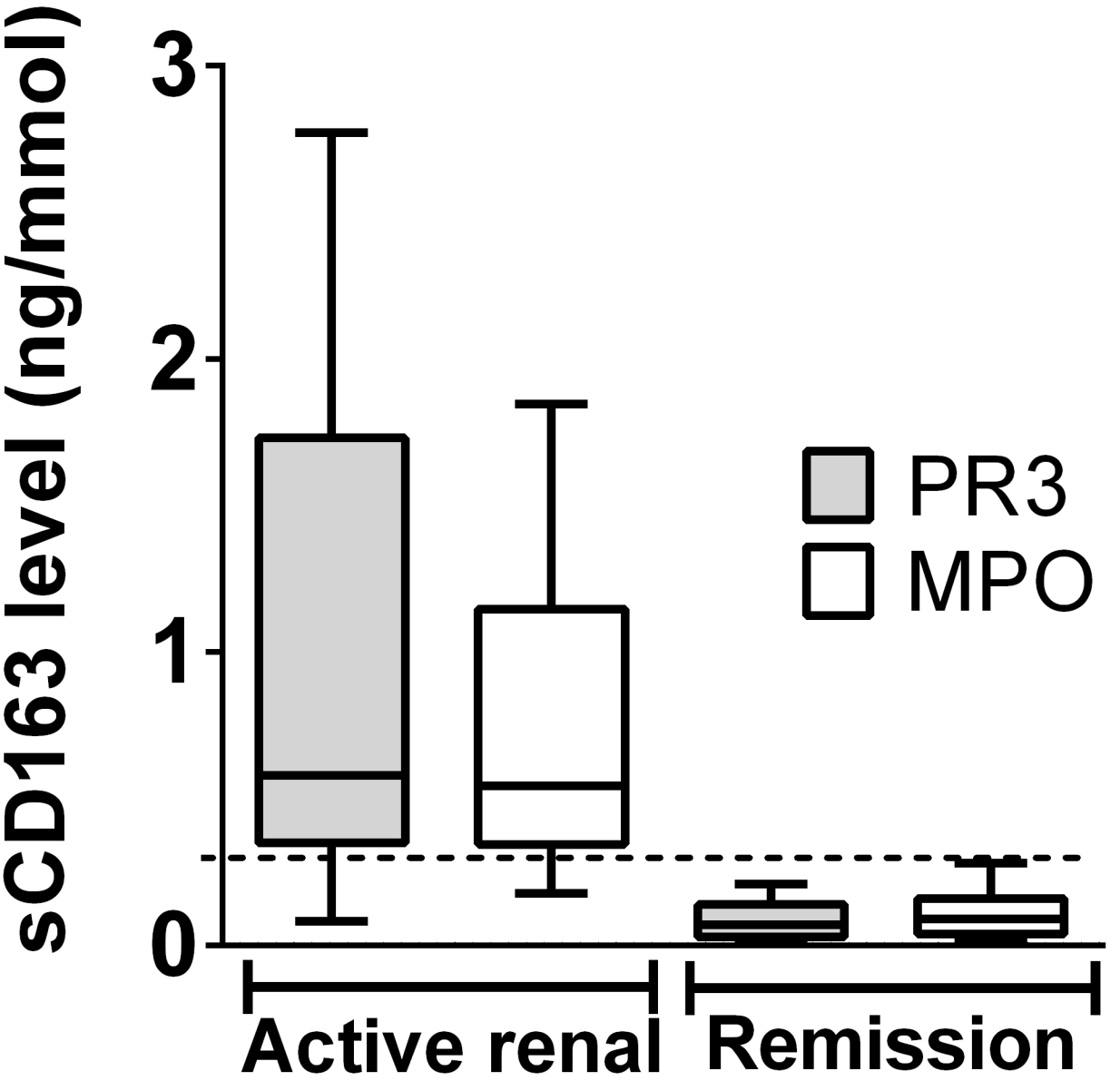
Supplemental figure 1. Rats at 28 days after immunisation with hMPO displayed moderate glomerulonephritis, with maximal injury evident at day 56. Panels A-D were obtained 28 days post-immunisation and panels E-F were obtained after 56 days. Low power image of H&E stained renal section at day 28, showing proliferative glomerulonephritis with red cell cast formation (white arrow, panels B.C.D) (x200). **B**. High power image of H&E stained glomerulus showing an area of focal necrosis with early crescent formation (white arrow) (x400). **C.** Proliferative glomerulonephritis (yellow arrow) with early crescent formation (white arrow) (x200, PAS). **D.** Early crescent formation (white arrow) (x400, PAS). **E.** Renal histology at day 56 showing interstitial nephritis (yellow arrow) and glomerular necrosis with crescent formation (white arrow) (x100, H&E). **F**. Established crescent formation 56 days post immunisation (x400, PAS).


A
%Δ from -80 control
40
20
0
-20
-40
Room temperature
4°C
-20°C
0
50
100
150
200
Time (h)
B
sCD163 (ng/ml)
**
8
6
4
2
0
1 2 3 4 5 6
Number of
Freeze thaws
C
sCD163 (ng/ml)
20
15
10
5
0
+ + + +
Urine dipstick
sCD163 level
4
3
2
1
0
Urine dipstick
for blood
1000
100
10
Dilution

Supplemental figure 2. sCD163 is stable in urine across a range of temperatures and urine registering positive for blood using urine dipstick is negative for urine sCD163. **A**. Six samples of known sCD163 level were stored for 24 and 168 hours (one week) at room temperature, 4^{o}C and -20^{o}C. The % change in sCD163 level from samples stored in parallel at -80^{o}C was plotted against time; mean±SEM. **B**. Samples were subjected to between 1 and 6 freeze-thaw cycles and sCD163 level determined by ELISA; mean±SEM. **C**. Healthy control urine was spiked with serial dilutions of blood and the level of sCD163 was determined by ELISA. The + symbols indicate those dilutions at which the urine appeared macroscopically blood stained. The dotted line indicates the upper limit of normal as determined in the inception cohort.

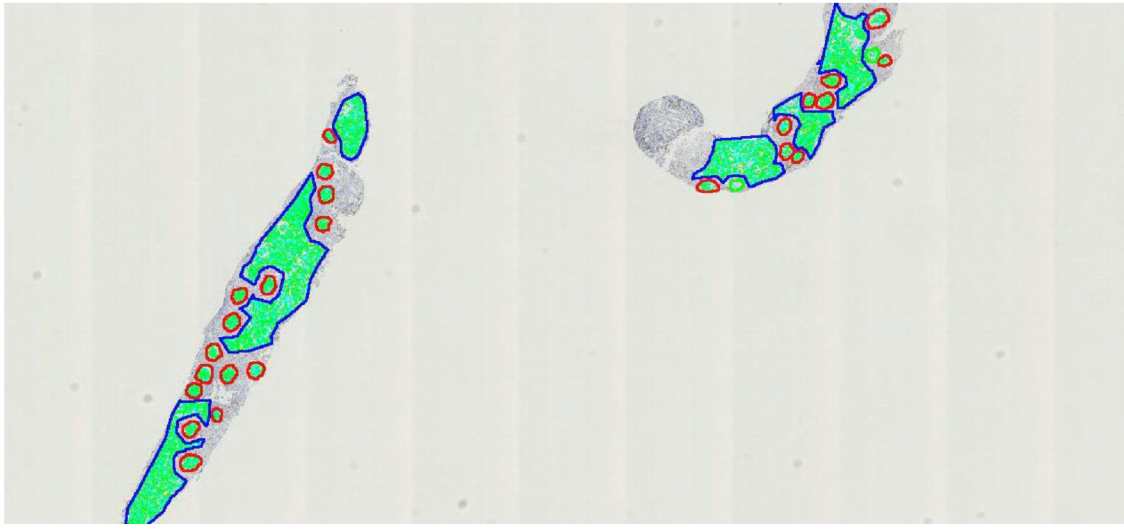

A
sCD163 level (ng/mL)
3000
2000
1000
0
Active
Yes
No
DC
HC
Vasculitis
B
Serum sCD163 (ng/mL)
10000
1000
100
r=0.15
0.001
0.1
10
Urine sCD163 (ng/mL)

Supplemental figure 3. sCD163 levels are not elevated in the blood of patients with systemic vasculitis. A. sCD163 levels were determined in serum by ELISA and levels were compared between patients with active and remission disease as well as disease controls and healthy controls. Data are presented as median sCD163 ng/ml with interquartile range. Non-parametric one-way ANOVA (Kruskal-Wallis test) and Dunn's multiple comparison tests were used to test for significance of each group compared to the active vasculitis group. **B.** sCD163 levels were also determined in urine by ELISA and the degree of correlation between serum and urine levels were determined by Spearman's test (n=337).

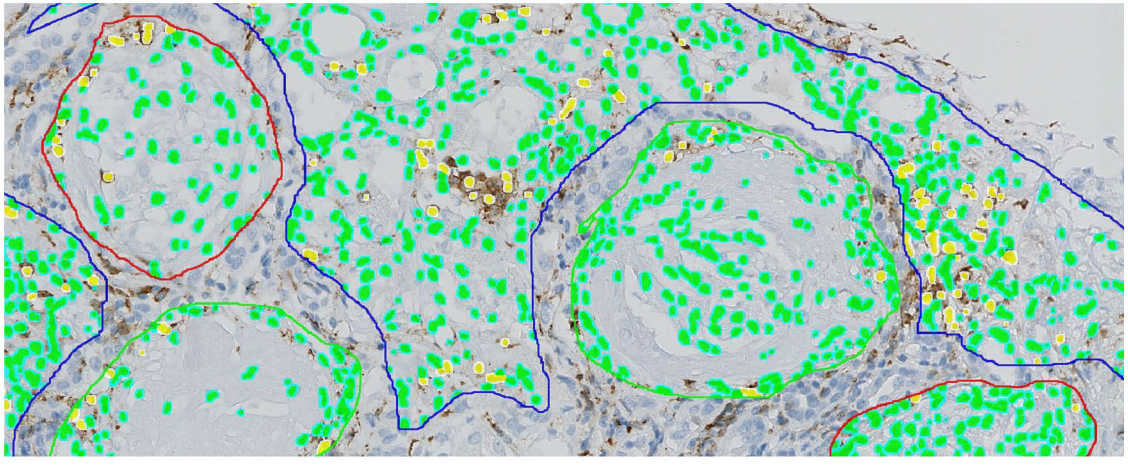

sCD163 level (ng/mmol)
3
2
1
0
PR3
MPO
Active renal
Remission

Supplemental figure 4. Urinary sCD163 levels are not different between MPO-ANCA (n=36 active, 113 remission) and PR3-ANCA (n=25 active, 190 remission) positive patients. Urinary sCD163 levels, as determined by ELISA and normalised to urine creatinine, were stratified by ANCA specificity.

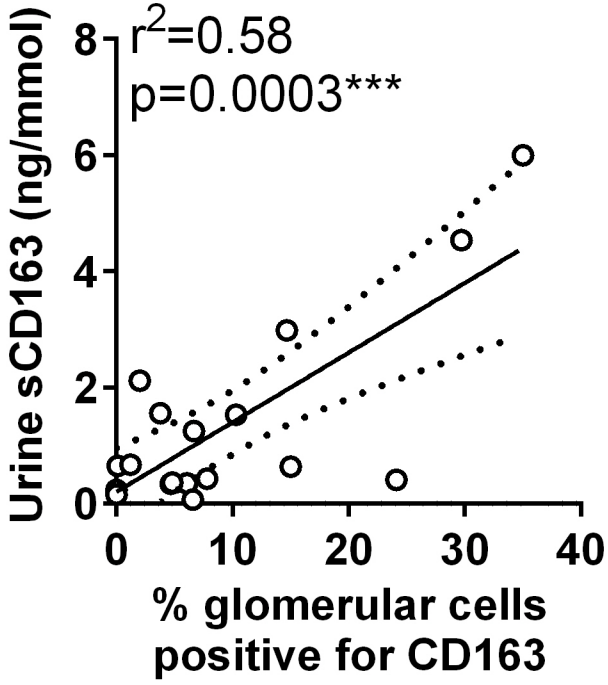
A



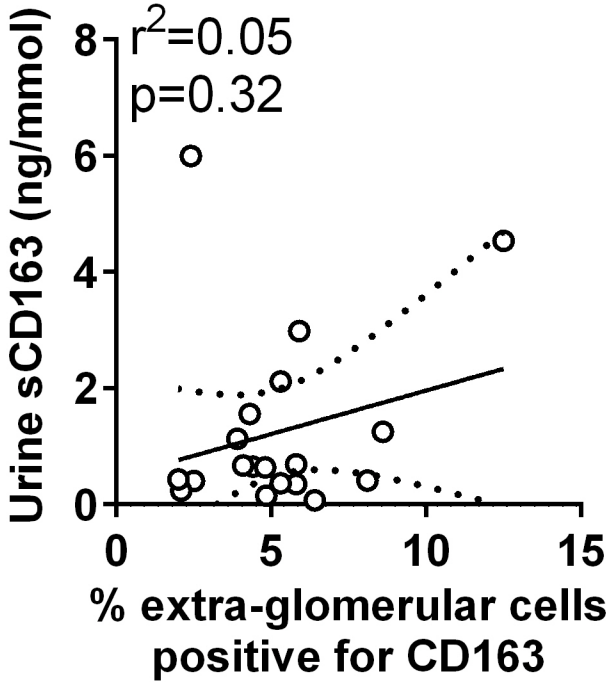
B



C


r2=0.58
p=0.0003***
Urine sCD163 (ng/mmol)
0
2
4
6
8
0
10
20
30
40
% glomerular cells
positive for CD163

D


r2=0.05
p=0.32
Urine sCD163 (ng/mmol)
0
2
4
6
8
0
5
10
15
% extra-glomerular cells
positive for CD163

Supplemental figure 5. Urinary sCD163 levels correlate with glomerular CD163 staining but not extra-glomerular staining. (A) Renal tissue was stained for CD163 and separate areas were defined for glomeruli (red), obsolescent glomeruli (green) and extra-glomerular tissue (blue). (B) Vision analysis software was trained to differentiate between nuclei surrounded by DAB staining (yellow) and cells with no DAB staining (green). The level of normalised urine sCD163 was then correlated with the fraction of cells stained for CD163 in the glomerular (C) and extra-glomerular (D) compartments. ***$p<0.005$

	Accuracy (95% Interval)	Sensitivity	Specificity	PPV	NPV
Normalised sCD163 > 0.3	0.97 (0.83 - 1)	1	0.96	0.88	1
CRP > 5	0.65 (0.45 - 0.81)	1	0.54	0.39	1
New/increased haematuria	0.87 (0.7 - 0.96)	0.43	1	1	0.86
>4-fold rise in ANCA titre*	0.84 (0.66 - 0.95)	0.57	0.92	0.67	0.88

Supplemental table 1. Biomarker comparison of urine sCD163 with CRP, urinalysis and ANCA for discriminating biopsy-proven renal flare from remission. The 4 biomarkers in question were compared for their ability to identify those with a biopsy-proven renal flare (n=7), all of whom had elevated urine sCD163. In the subset of patients suffering a biopsy-proven flare (n=7) *or turning positive from negative. PPV/NPV = Positive and negative predictive value

	N	Glomerular macrophage infiltration expected
Non-vasculitic glomerulonephritis	*30*	
IgA nephropathy	9	Yes
Lupus nephritis	2	Yes
C3 glomerulopathy	3	Yes
*Minimal change disease / FSGS**	6	No
Cryoglobulinaemia	2	Yes
Others	8	Yes
Disease controls without glomerular inflammation	*54*	
Hypertensive nephrosclerosis	12	No
Diabetic nephropathy	11	No
Interstitial nephritis	3	No
Aortic endovascular stent infection	2	No
Pyelonephritis	3	No
Sjogren's syndrome	2	No
Other primary kidney disease	5	No
Other extra-renal disease	16	No
ITU patients without sepsis or AKI#	463	No
ITU patients with sepsis but no AKI#	286	No
ITU patients with sepsis and AKI#	32	No

Supplemental table 2. Summary of diagnoses in the disease control cohort. *FSGS=Focal and segmental glomerulosclerosis; #AKI = Acute Kidney injury