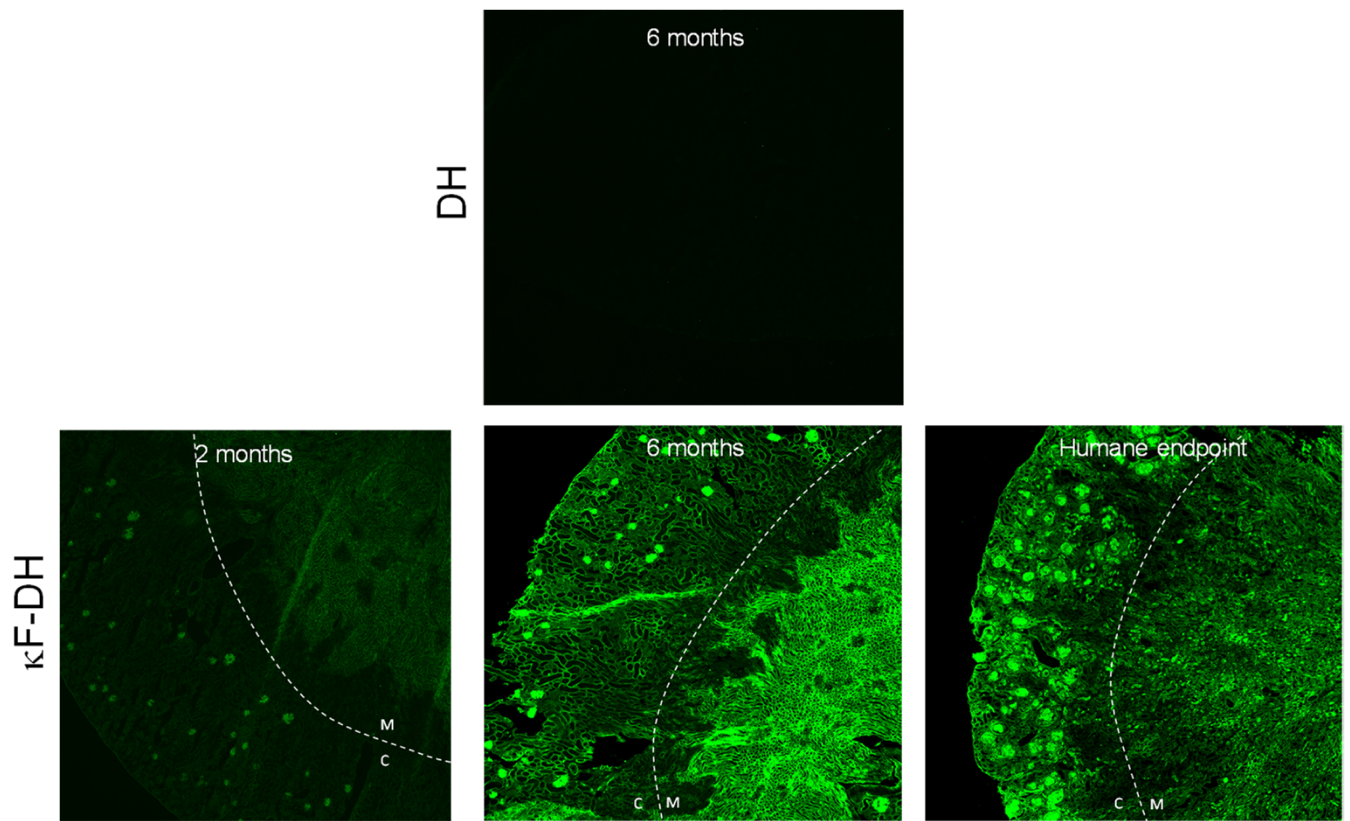
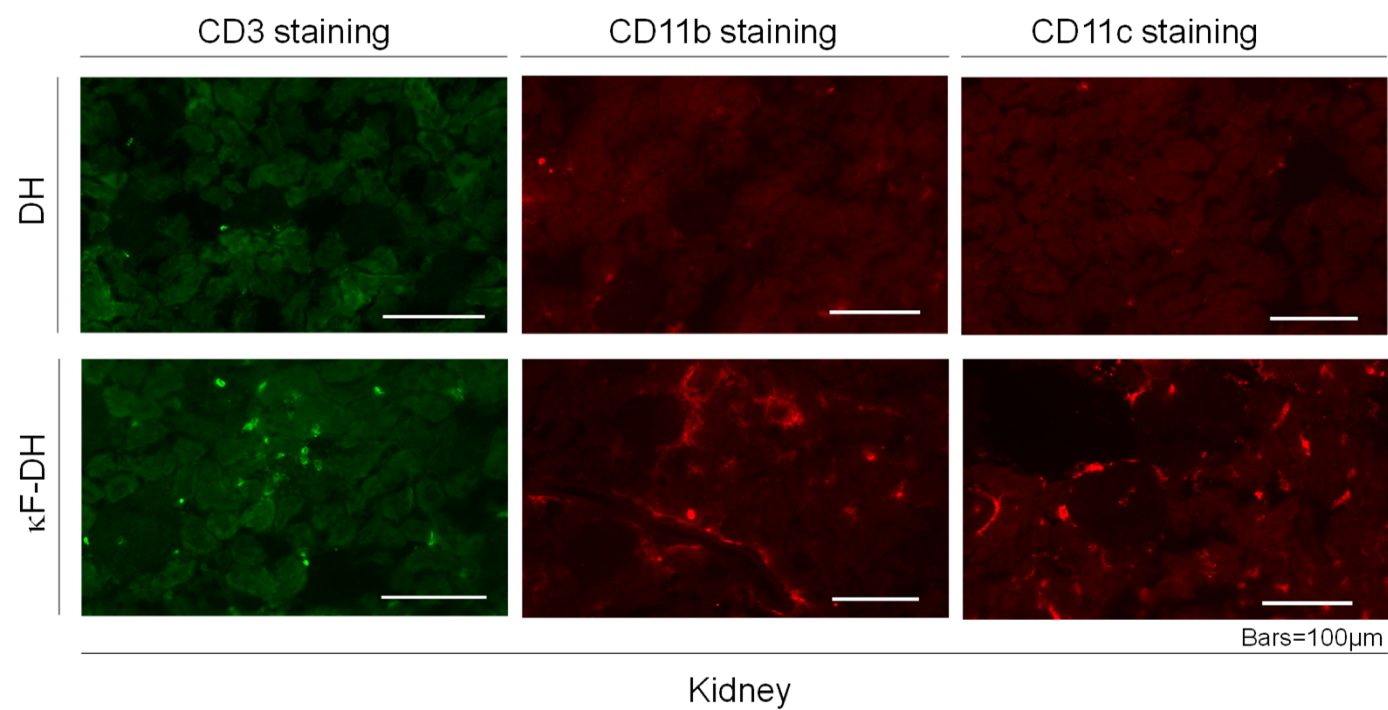


Supplemental Figure 1 : *Ex-vivo* observations of kidneys from κ F-DH vs DH-LMP2A mice. Macroscopic observation revealed bloodless kidneys in κ F-DH mouse at sacrifice (humane endpoint) compared to a DH mouse of the same age. Left panel: whole kidney, right panel: longitudinal section. Scale is in cm.

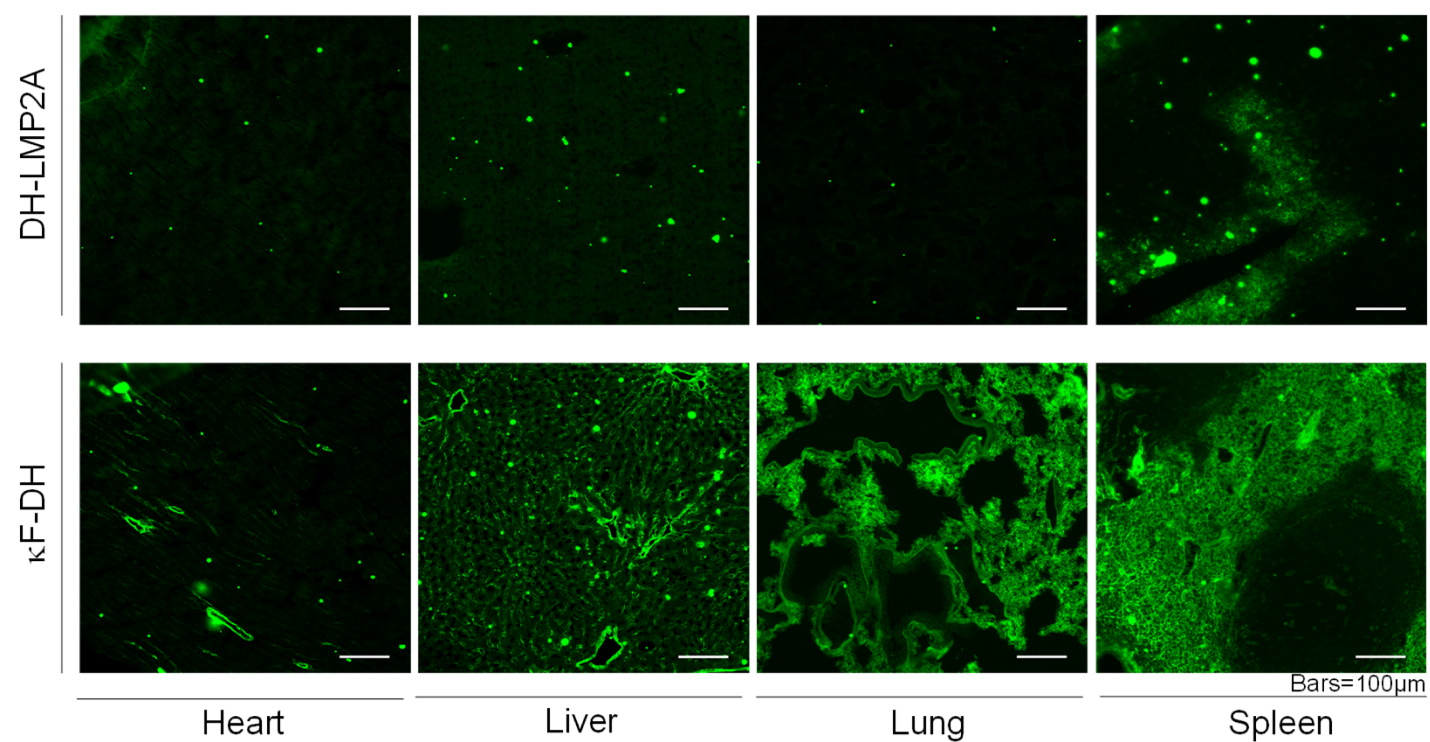


Supplemental Figure 2 : **Kidney sections analysis of κF-DH mice.** Immunofluorescence microscopy on frozen kidney sections stained with an anti-mouse kappa antibody of κF-DH mice at 2, 6 months and humane endpoint, compared to a DH control mouse. Kappa light chain deposits in κF-DH are detectable in the cortex (C) and medulla (M) of the kidney as soon as the age of 2 months. Original magnification x40.

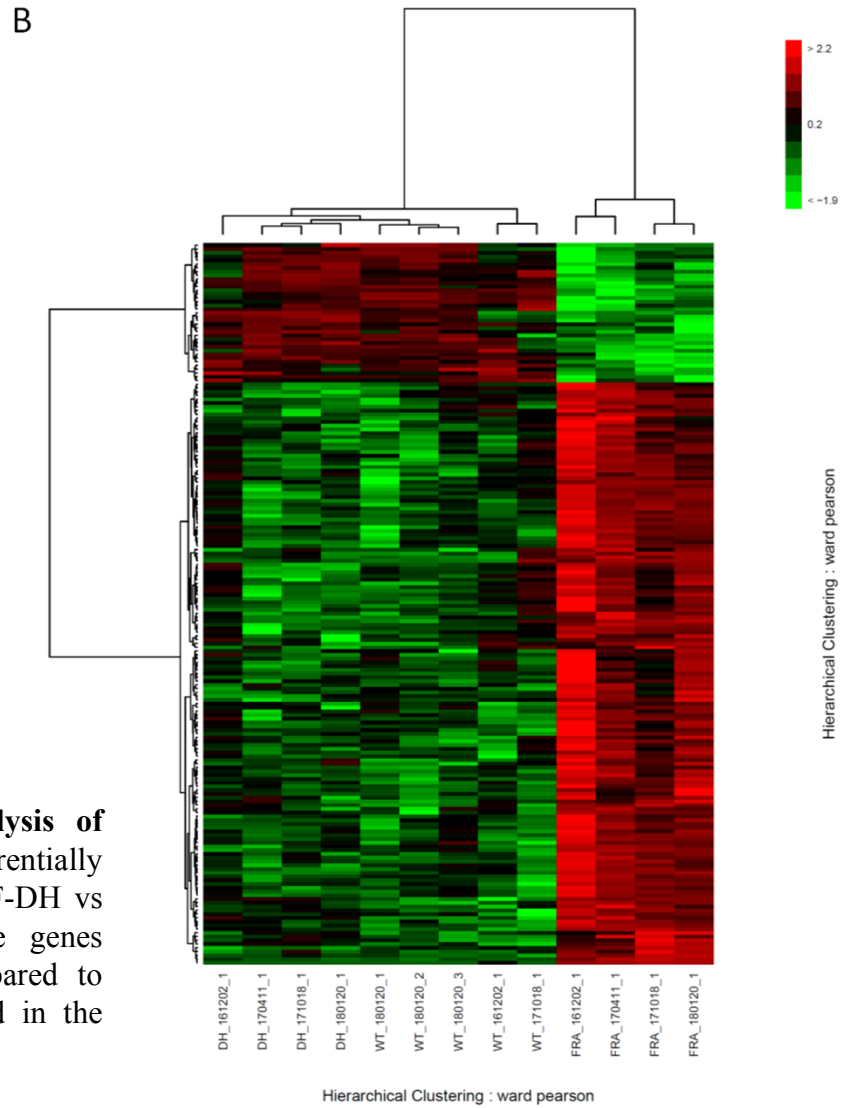
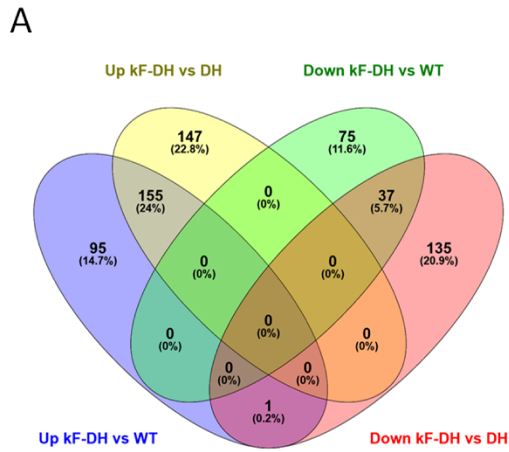


Supplemental Figure 3 : **Immune cells infiltrate the kidney of κF-DH.** Immunofluorescence microscopy on frozen kidney sections of κF-DH mice using an anti-mouse CD3 (T cells), CD11b (granulocytes/macrophages) or CD11c (dendritic cells) at 6 months compared to DH control mice. Original magnification x200.

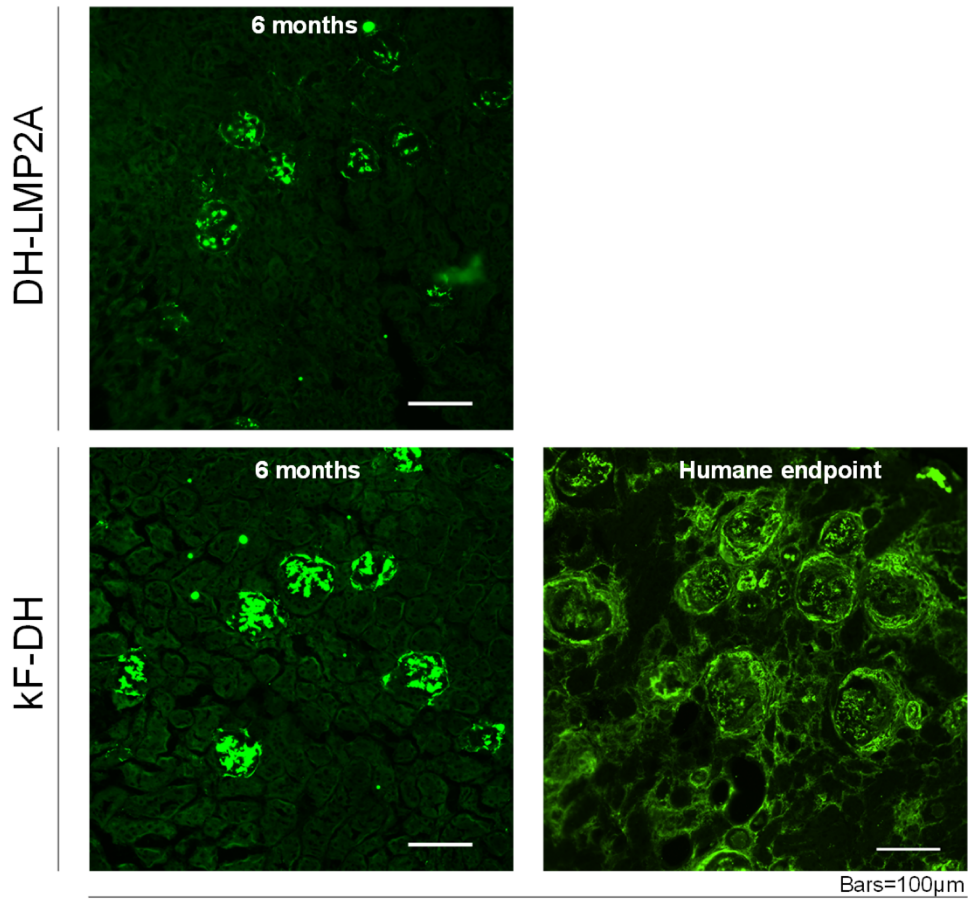
Mouse kappa staining



Supplemental Figure 4 : **Deposits detection in other organs of κF-DH mice.** Immunofluorescence microscopy on frozen heart, liver, lung and spleen sections of κF-DH mice using an anti-mouse kappa antibody at 6 months, compared to DH control mice. Kappa light chain deposits in κF-DH are detectable in all these organs. Original magnification x200.



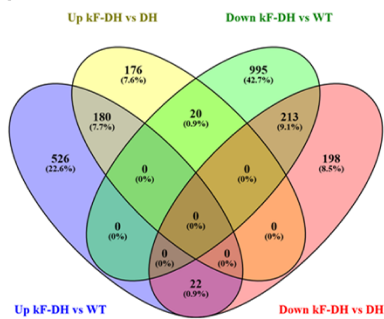
Supplemental Figure 5: **RNA-Seq analysis of glomeruli.** (A) Venn diagram of differentially expressed genes in κ F-DH vs Wt and κ F-DH vs DH. (B) Heatmap representing all the genes differentially expressed in κ F-DH compared to both controls (WT and DH) as obtained in the Venn diagram in (A).



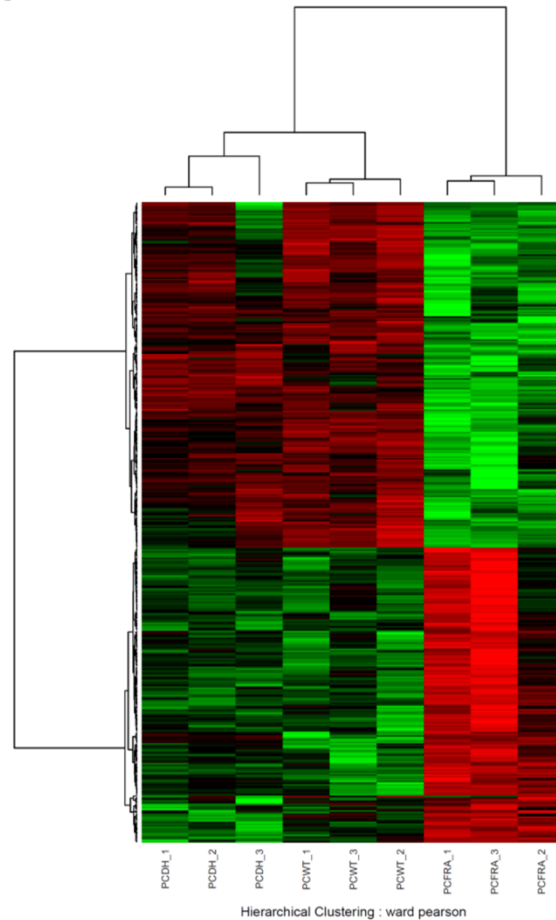
Tenascin C staining on kidney sections

Supplemental Figure 6 : **Tenascin C analysis in kF-DH mice.** Immunofluorescence microscopy on complete frozen kidney sections of kF-DH mice using an anti-mouse tenascin C antibody at 6 months and mice at humane endpoint, compared to DH control mice. Original magnification x200.

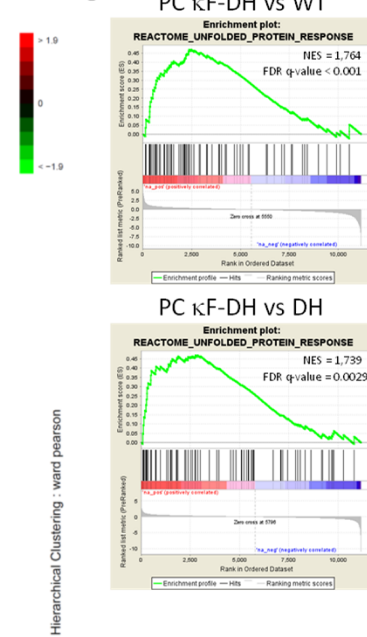
A



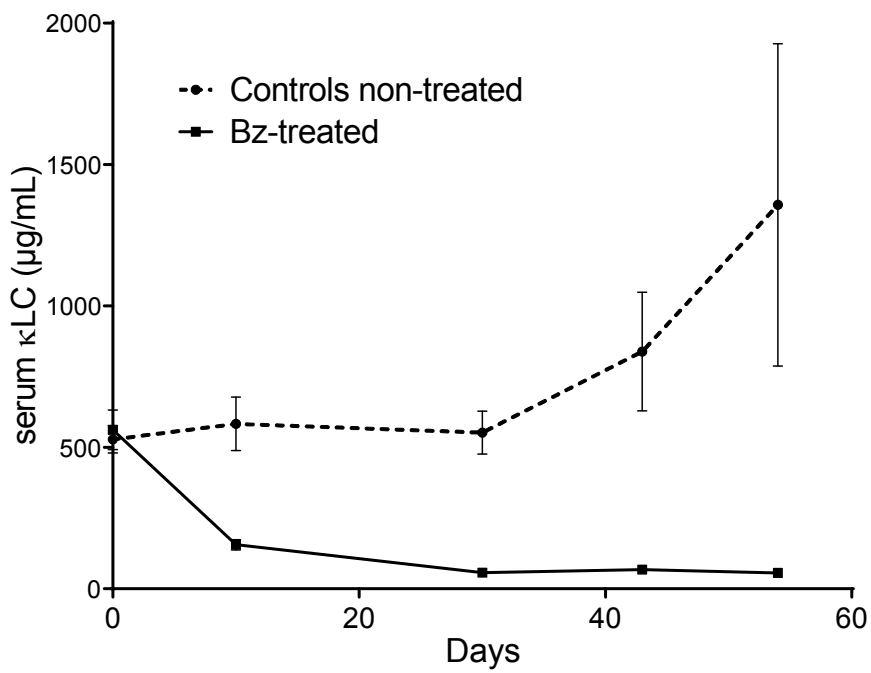
B



C



Supplemental Figure 7: **RNA-Seq analysis of plasma cells.** (A) Venn diagram of differentially expressed genes in κ F-DH vs WT and κ F-DH vs DH. (B) Heatmap representing all the genes differentially expressed in κ F-DH compared to both controls (WT and DH) as obtained in the Venn diagram in (A). (C) Gene set enrichment analysis (GSEA) plots showing enrichment in the Reactome UPR pathway of κ F-DH plasma cells compared to WT (Top) and DH (Bottom).



Supplemental Figure 8 : **Bortezomib/cyclophosphamide-based therapy efficacy in κF-DH mice.** Serum free light chains levels (in μ/mL) in treated and non-treated κF-DH mice during the course of the treatment.