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## Genetic and molecular markers of proteinuria and glomerulosclerosis

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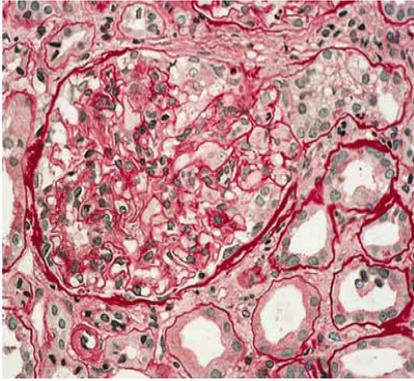
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**Colour figures**

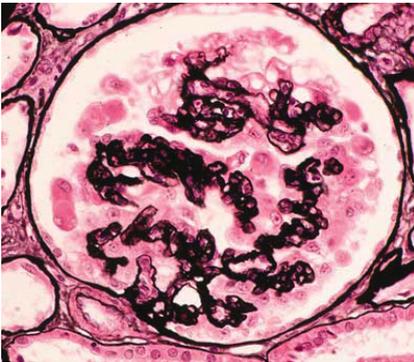
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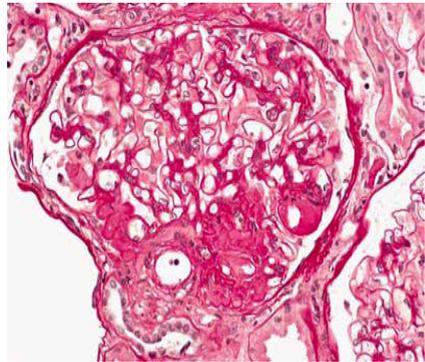
tip FSGS



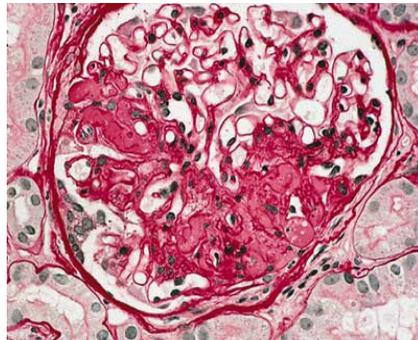
cellular FSGS



collapsing FSGS

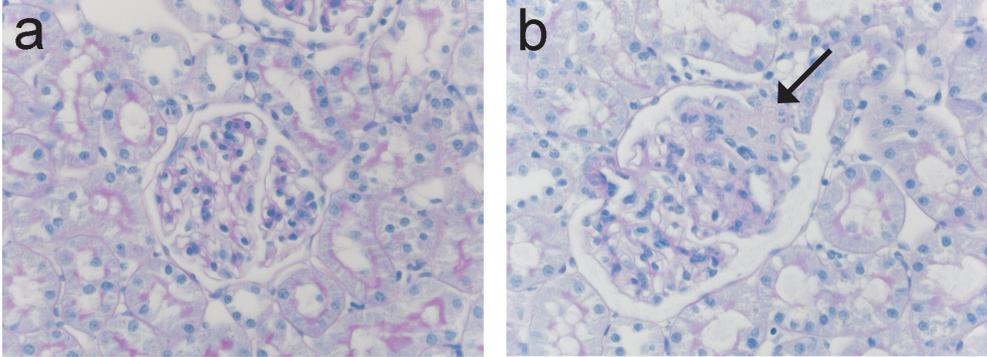


perihilar FSGS

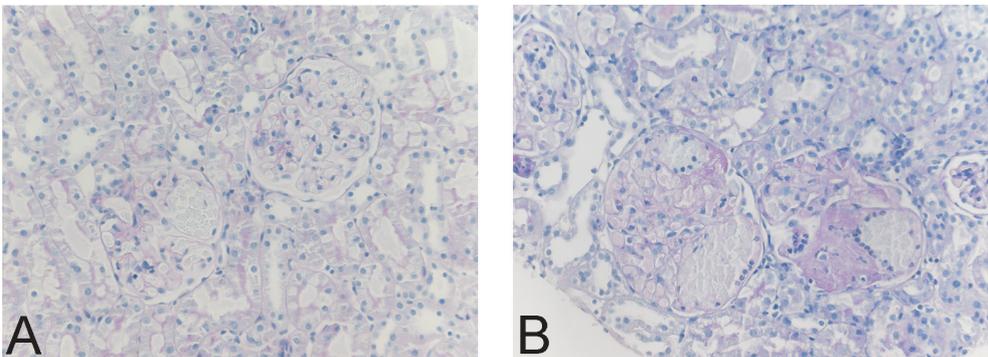


FSGS NOS

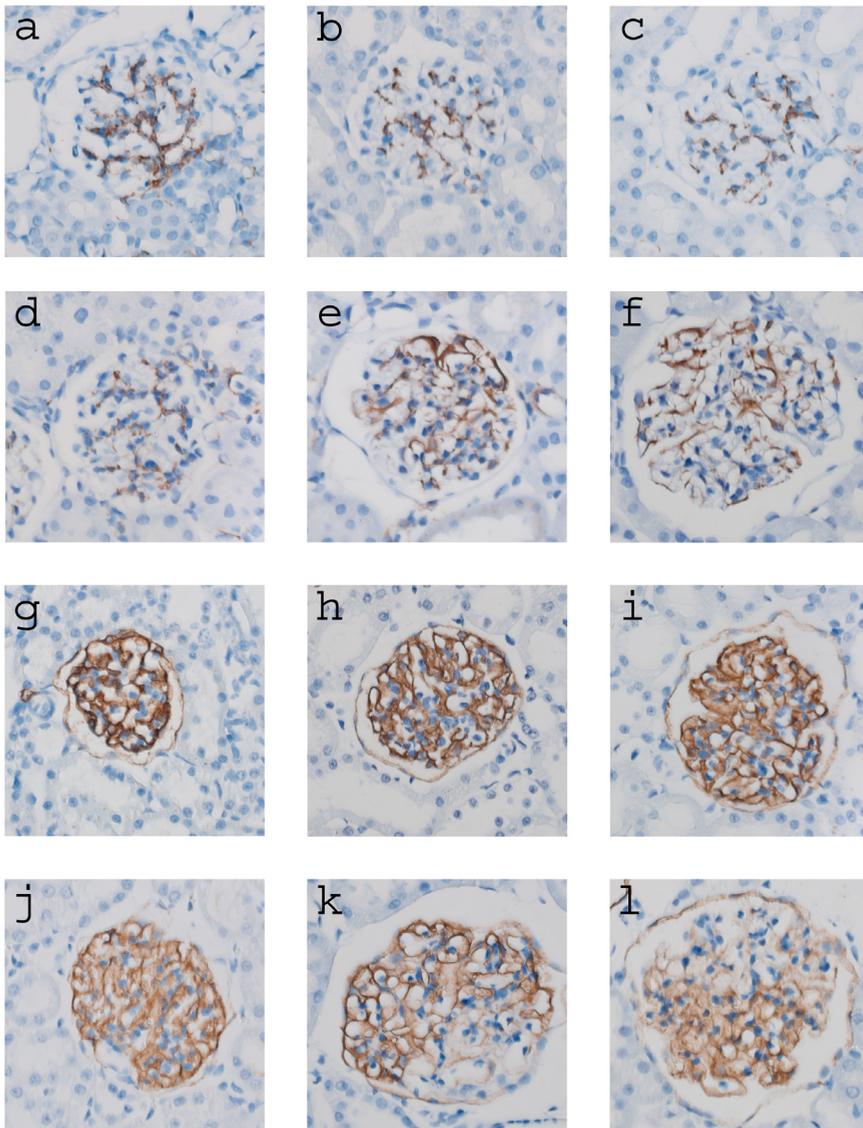
**Chapter 1, figure 4.** Typical glomerular morphology of the five FSGS variants according to the “Columbia” classification. Published with permission from Stokes *et al.*<sup>153</sup>



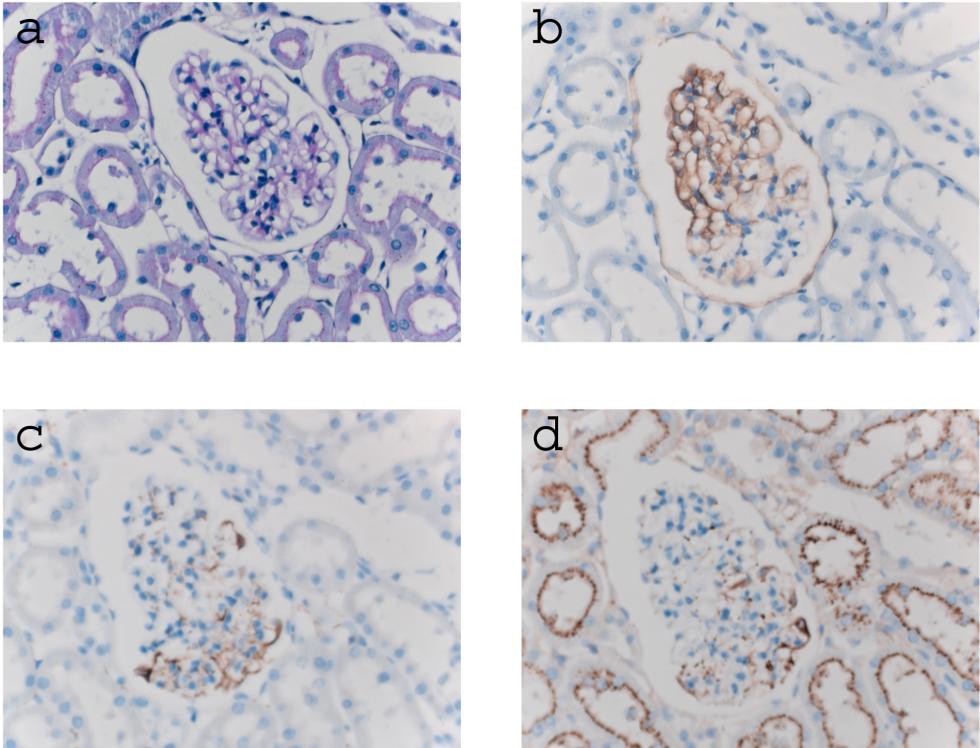
**Chapter 3, figure 3.** Histological images representing the range of glomerular damage at *day 21* in backcross rats. Periodic acid-Schiff staining. a) normal glomerulus; b) segmental sclerosis with adhesion of the tuft to Bowman's capsule (arrow).



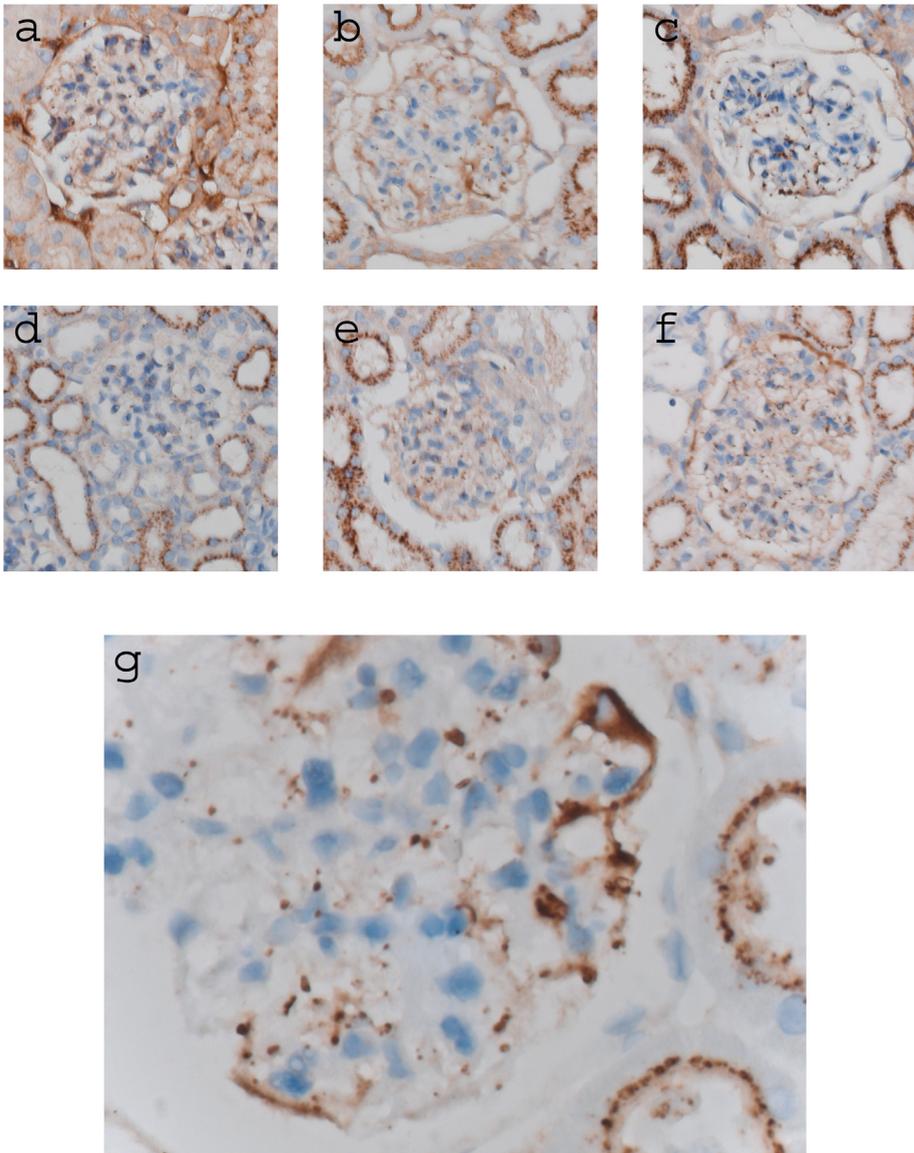
**Chapter 4, figure 4.** Examples of glomeruli with microaneurysms in Lew/Maa bone marrow chimeras. Fewer microaneurysms were found in the kidneys of Lew/Maa rats with bone marrow from Lew/Moll (B) compared to the kidneys of Lew/Maa rats with bone marrow from Lew/Maa (A).



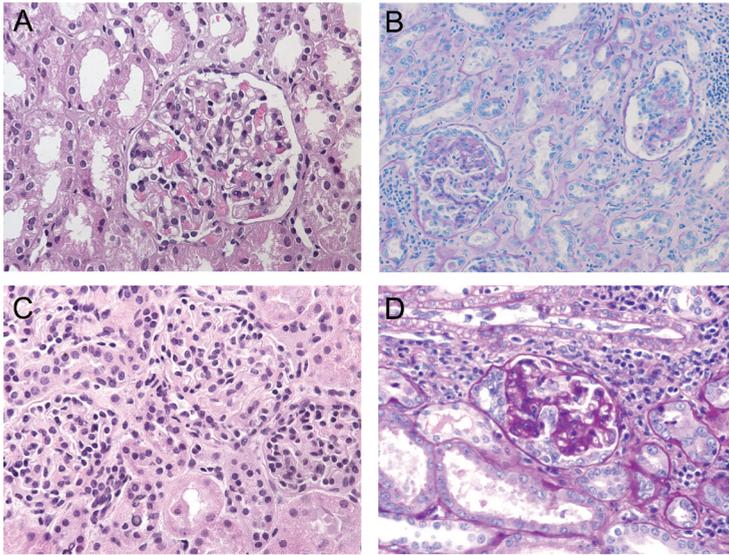
**Chapter 5, figure 3.** Expression of desmin and podoplanin proteins in male MWF and male SHR. Representative photographs are of desmin staining in SHR (a-c) and MWF rats (d-f) at 4 weeks (a and d), 6 weeks (b and e), and 8 weeks (c and f) of age. At 6 and 8 weeks of age, MWF rats exhibited focal and segmental expression of desmin protein in podocytes. Protein expression in SHR did not change. Representative photographs of podoplanin staining in SHR (g-i) and MWF rats (j-l) at 4 weeks (g and j), 6 weeks (h and k), and 8 weeks (i and l) of age. At 6 and 8 weeks of age, MWF rats exhibited focal and segmental loss of podoplanin protein expression in podocytes. Protein expression in SHR did not change.



**Chapter 5, figure 4.** Sequential kidney sections from an 8-week-old male MWF rat showing staining for periodic acid-Schiff (a), podoplanin (b), desmin (c), and albumin (d).



**Chapter 5, figure 5.** Expression of albumin protein in male and female MWF rats and male SHR. a-f: Representative photographs of albumin expression in MWF (a-c) and SHR (d-f) at 4 weeks (a and d), at 6 weeks (b and e), and 8 weeks (c and f) of age. Albumin droplets were present in podocytes of 6- and 8-week-old male and female MWF rats. g: higher magnification of a glomerulus of a male MWF rat showing albumin droplets in podocytes.



**Chapter 6, figure 1.** Representative histologic pictures of renal biopsies of patient 11. Both in native and transplant kidney, minimal change-like lesions are present in the first biopsy, followed by development of collapsing FSGS at a later time point. (A) Minimal change-like lesion in native kidney. (B) Collapsing FSGS in nephrectomy of native kidney. (C) Minimal change-like lesion a few days after renal transplantation. (D) Collapsing FSGS in renal allograft nephrectomy.

Case	Native Kidney		Transplant Kidney		
	Initial Biopsy	Nephrectomy	Months after transplant		
			< 1	1 - 12	> 12
4		N		N	
4 <sup>a</sup>					N
5	N		N		
6	N				N
8	M N	N			Co
10		N			N N
14	N			Co	N
16		N			N N
17	Ce N	N	M		N
18	N		M		N
19		N		Co	
1				Co	Co
1 <sup>a</sup>			M		
7	Co				N
11	M N	Co Co	M		Co
12		Co	M Co	Co	Co
13	Co			Co	
15		Co			
15 <sup>a</sup>			M		N
2	Ce			Ce	
3	Ce		Ce	Ce	
9	T		M		

<sup>a</sup>Second transplant

N: FSGS Not otherwise specified; Co: Collapsing FSGS; Ce: Cellular FSGS; T: Tip lesion FSGS; M: Minimal change disease-like lesion

**Chapter 6, figure 2.** FSGS variants in patients' native and transplant kidneys. For each patient, the FSGS variant and time to biopsy after transplantation are shown.

