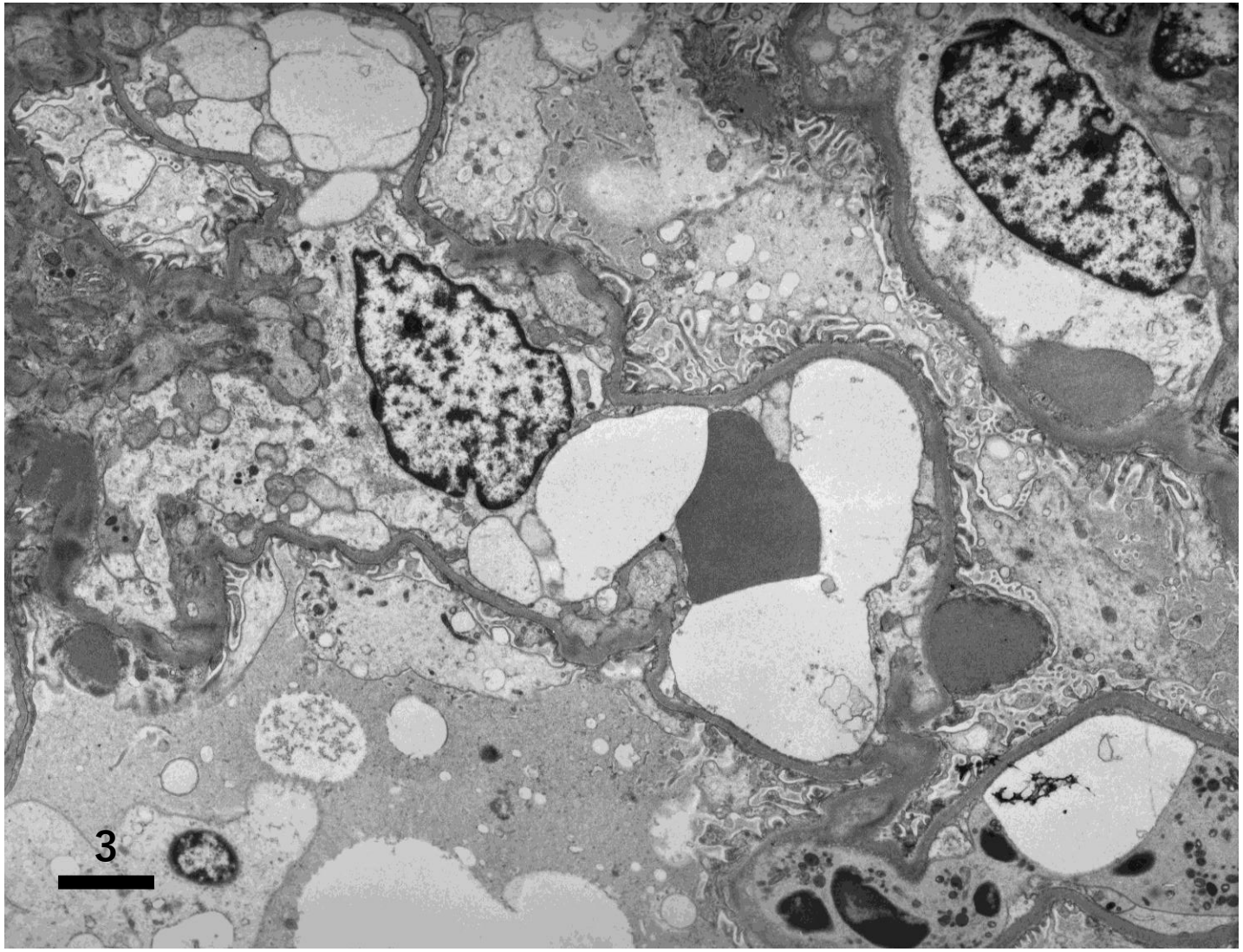
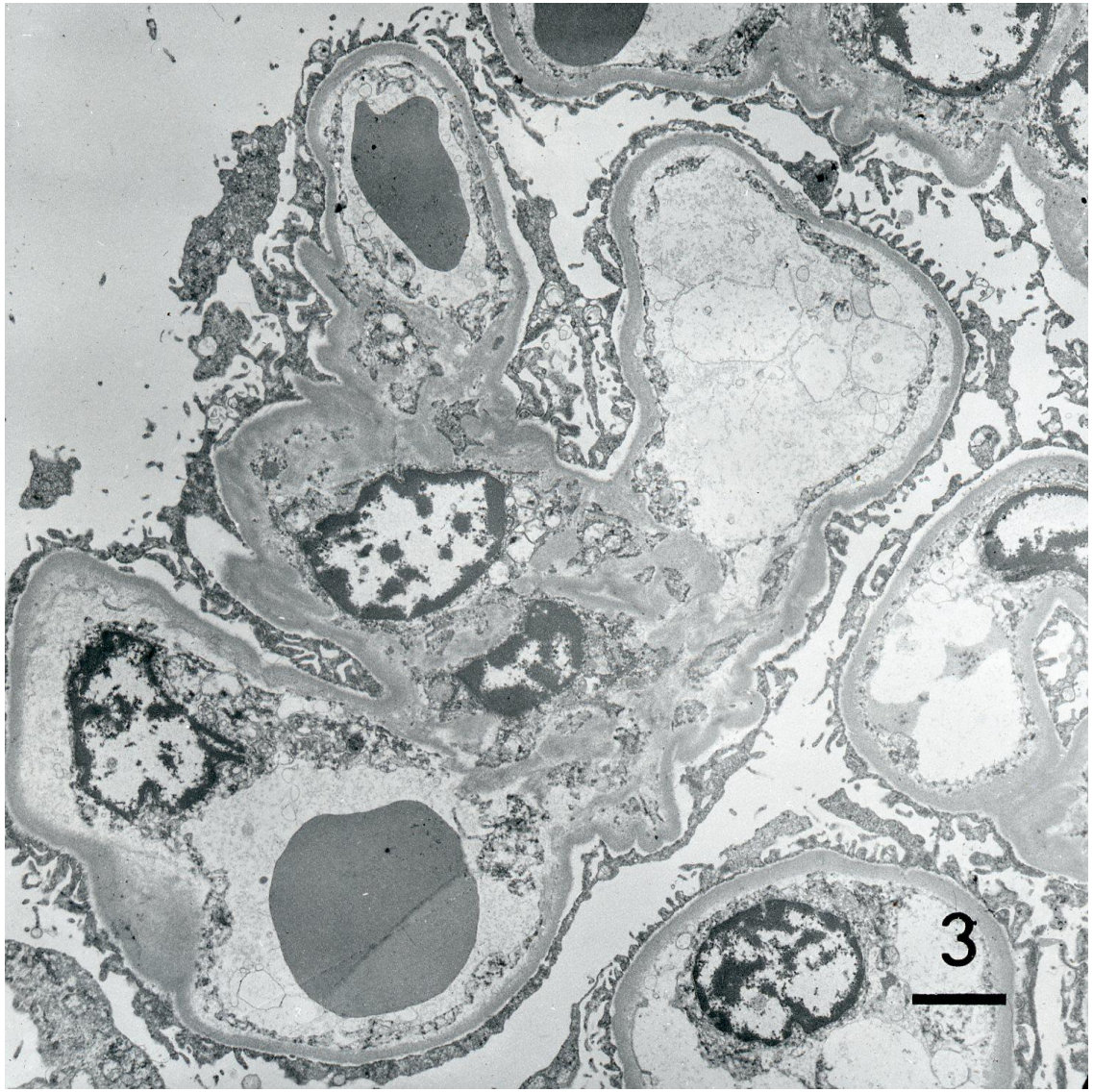
Electron microscopic features of glomerulonephritis and glomerulopathy

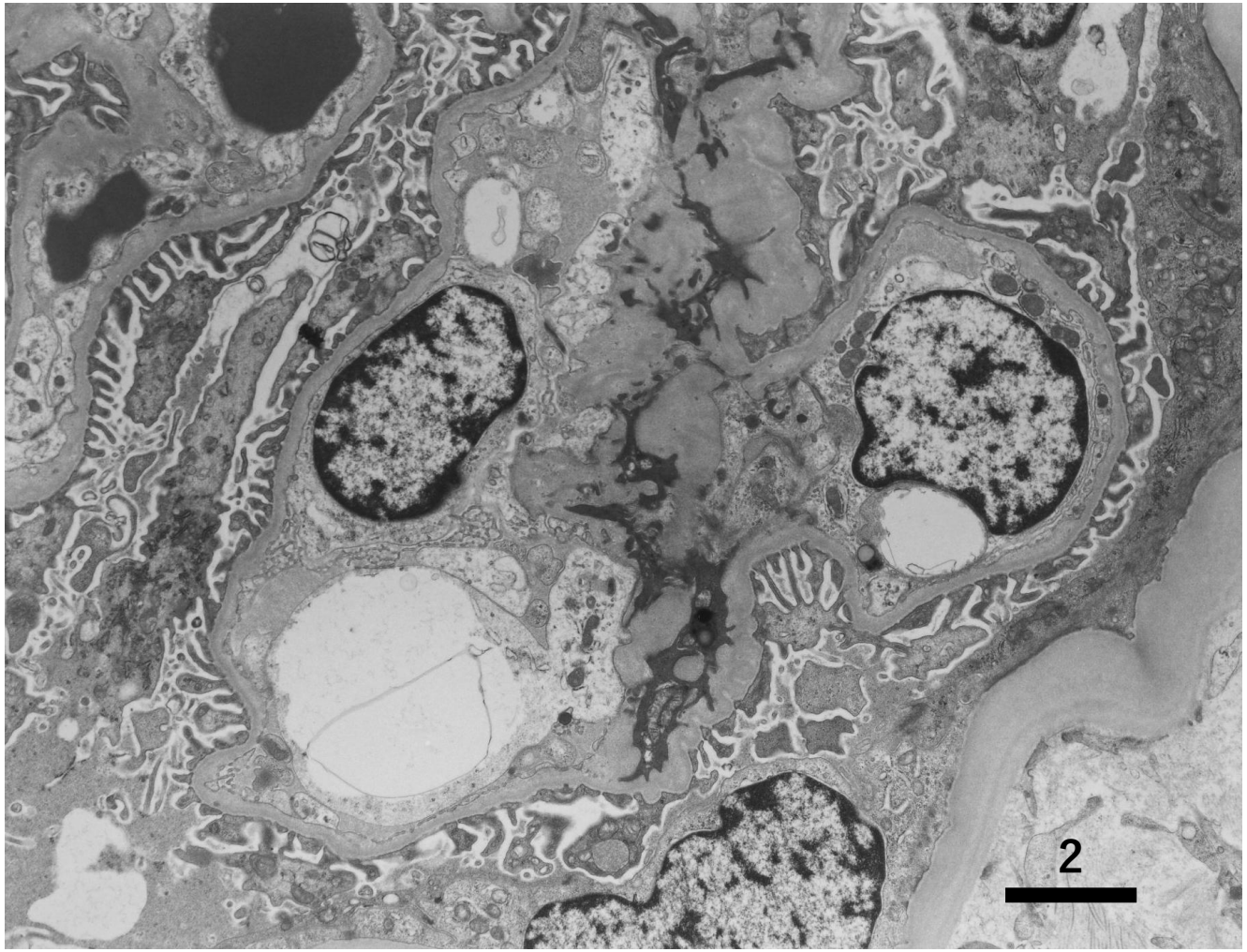
In addition to H&E, PAS, PAM and immunofluorescence analysis, electron microscopic study is essential for the diagnosis of glomerular disorders. Representative ultrastructural features of glomerulonephritis and glomerulopathy are presented.



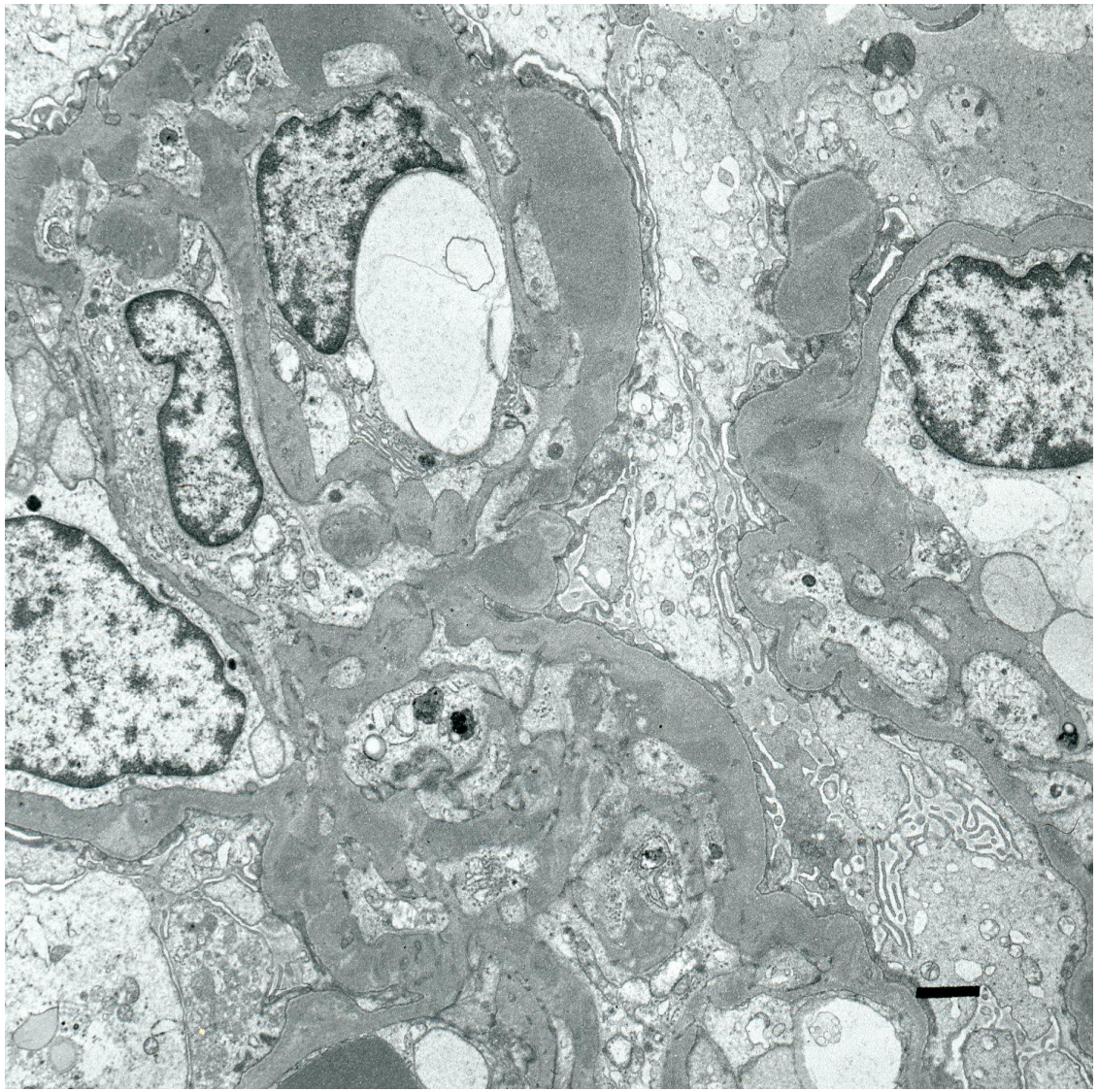
Ultrastructure of post-streptococcal acute glomerulonephritis (AGN).
Electron-dense humps are formed in the subepithelial space.



Ultrastructure of minimal change nephrotic syndrome (MCNS). Fusion of foot processes is observed. Neither deposition nor cellular growth is noted.

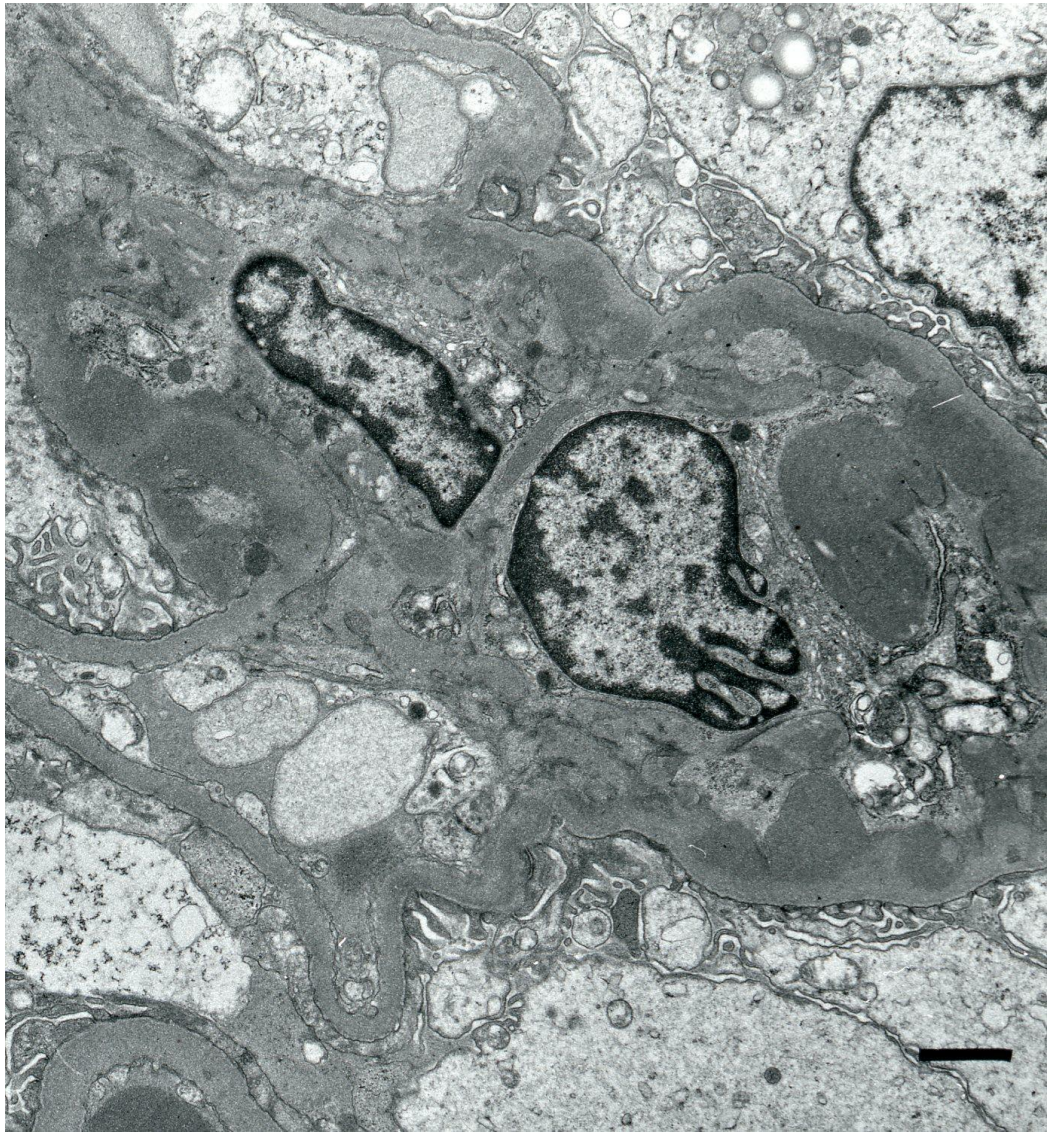


Ultrastructure of Alport syndrome in a pediatric case. The basement membrane is very thin (thin basement membrane disease).

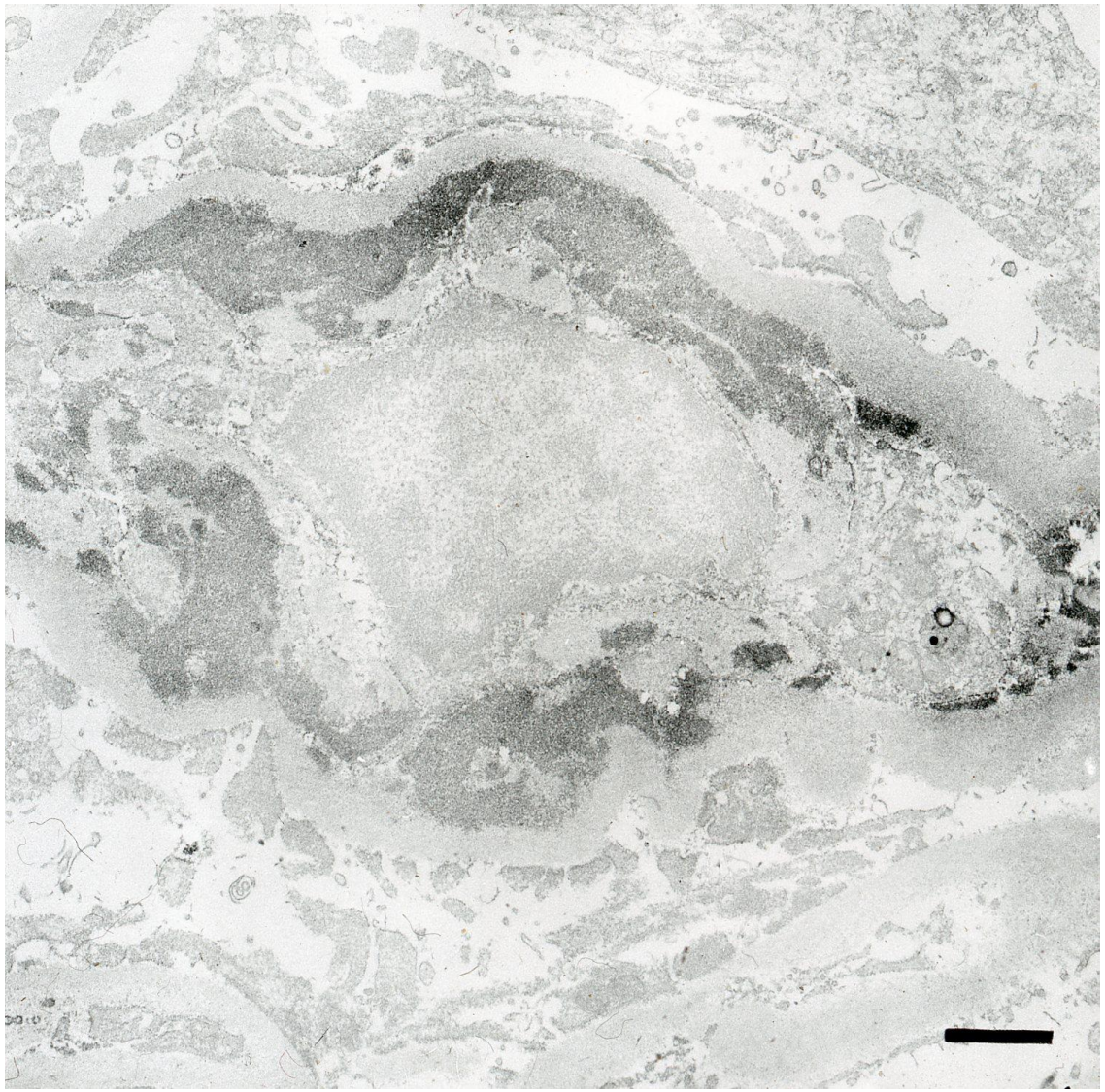


Ultrastructure of IgA nephropathy (IgAN). Electron-dense deposits are seen in the mesangial matrix. Mild mesangial cell growth is associated. The foot processes are fused.

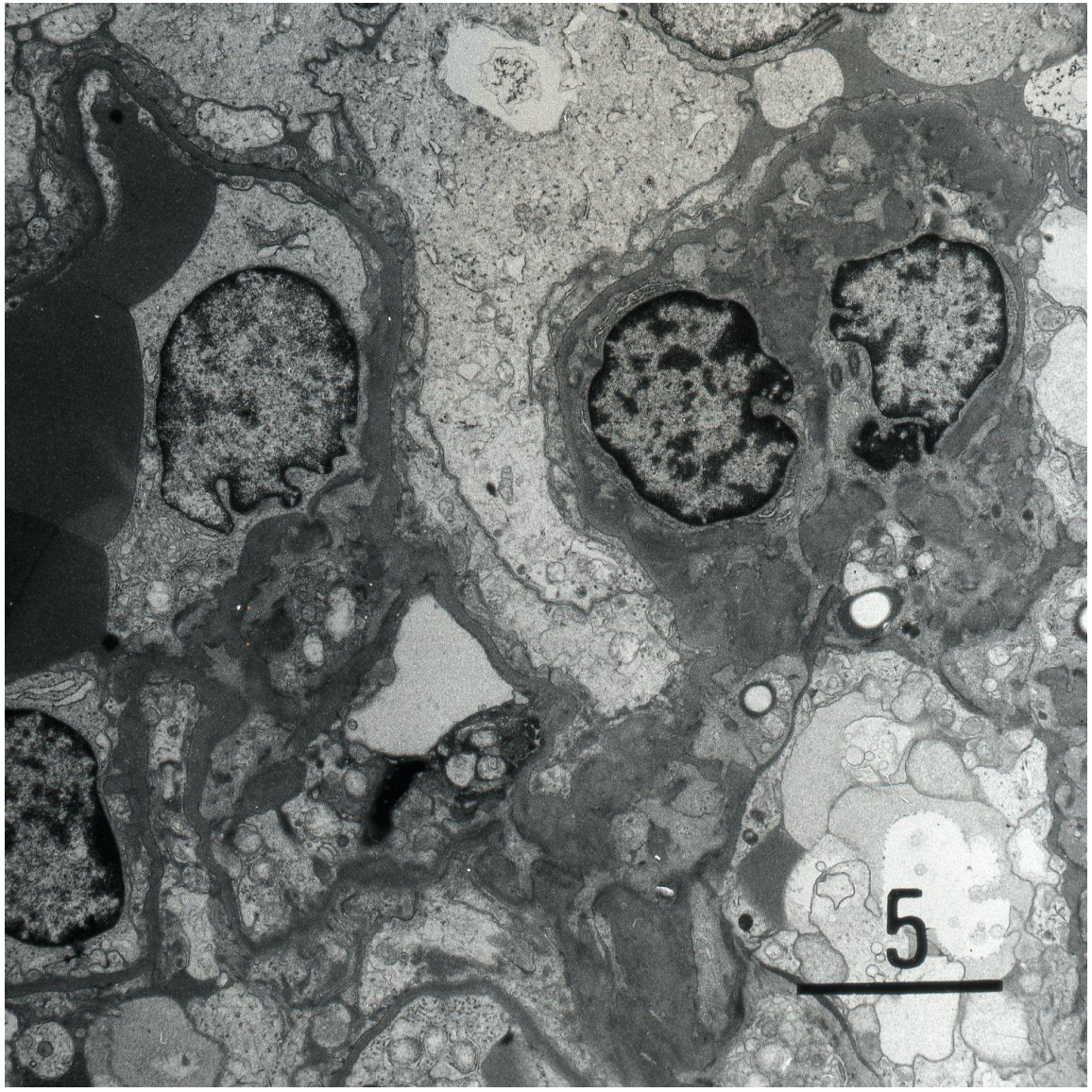
42M, IgAN



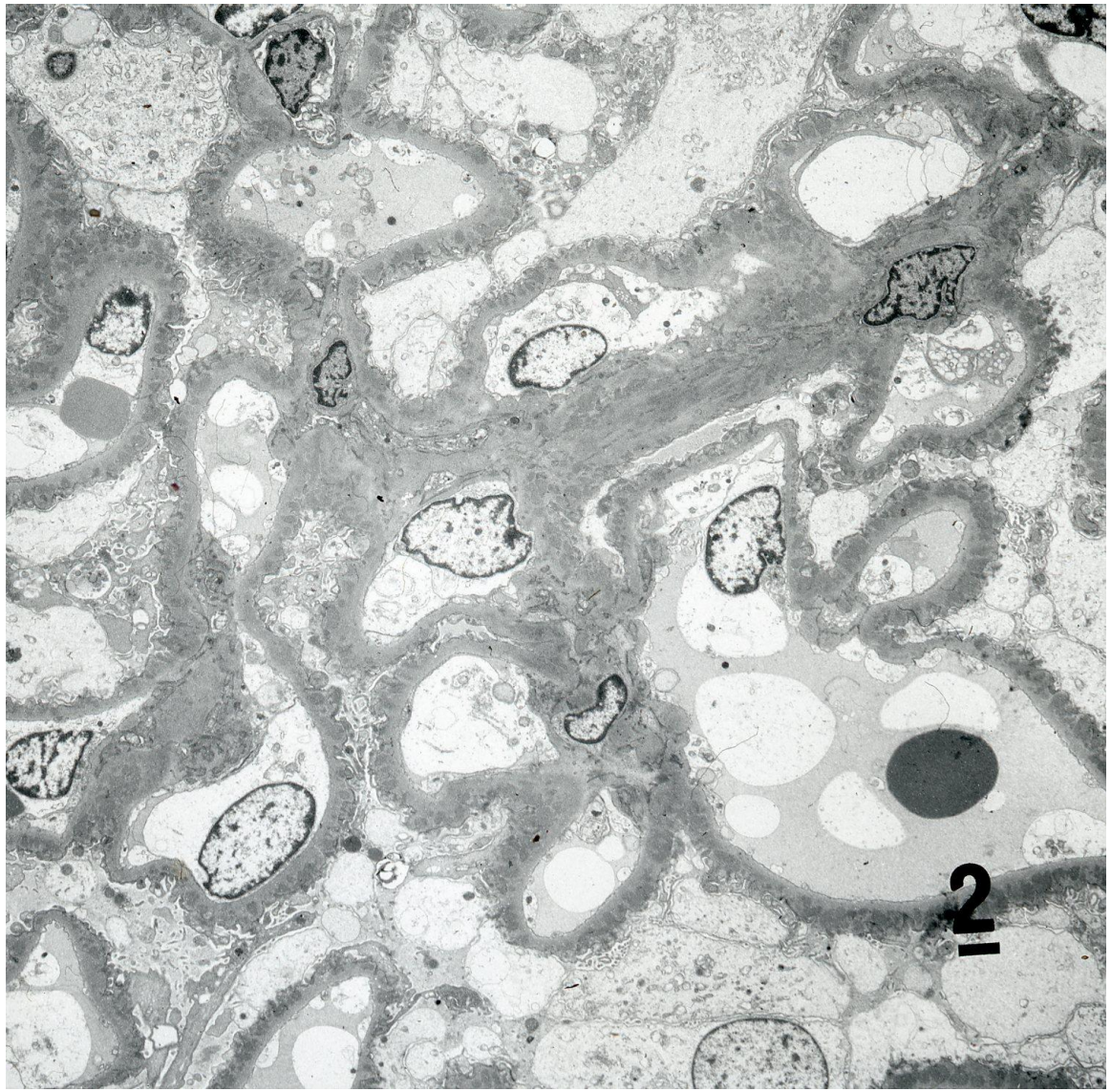
Ultrastructure of IgA nephropathy (IgAN). Electron-dense deposits are seen in the mesangial matrix (paramesangial deposits). Mild mesangial cell growth is associated. The foot processes are fused.



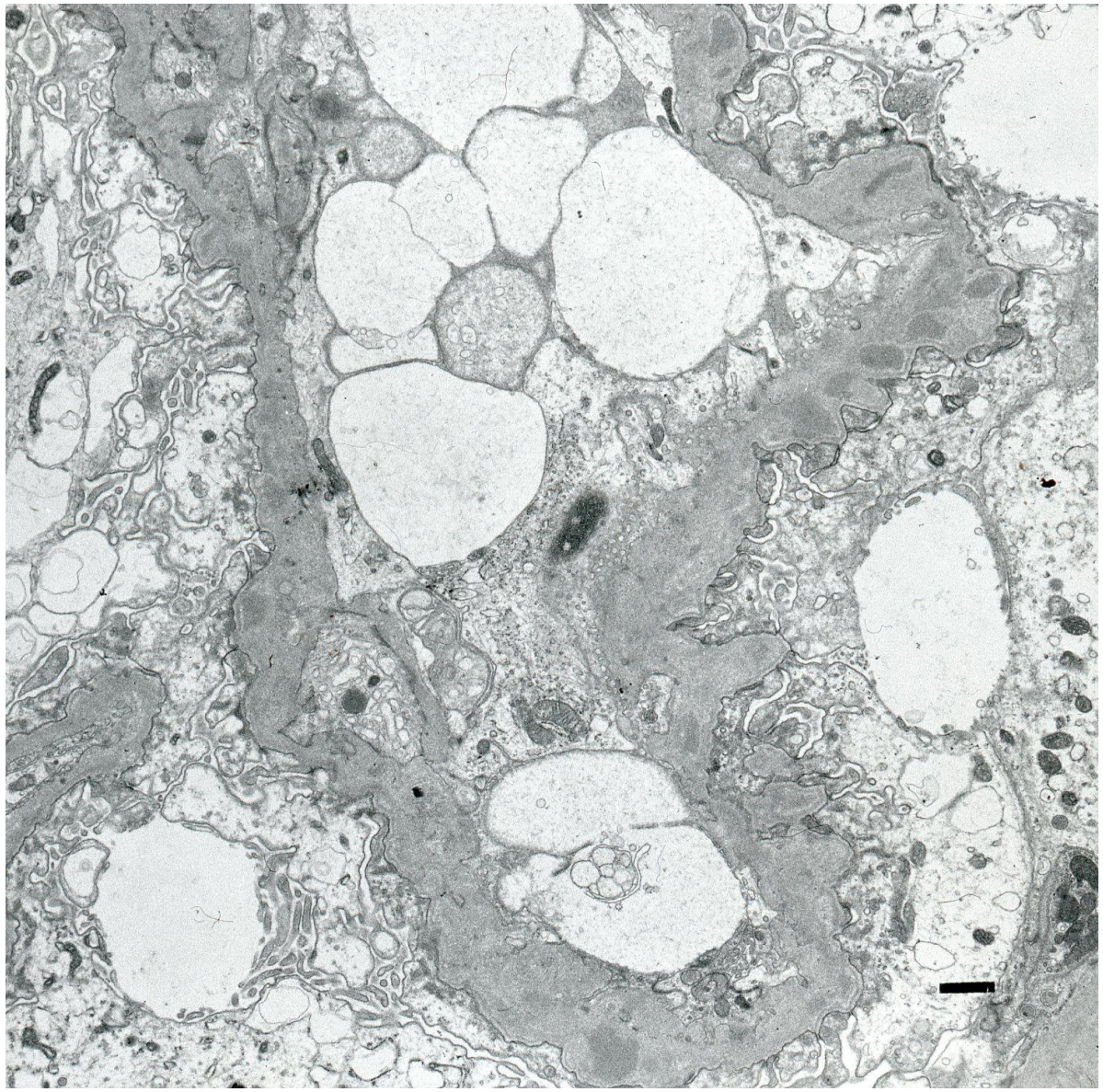
Ultrastructure of IgA nephropathy (IgAN).
Immunoelectron microscopy (pre-embedding method) for IgA discloses IgA deposits in the mesangial matrix.



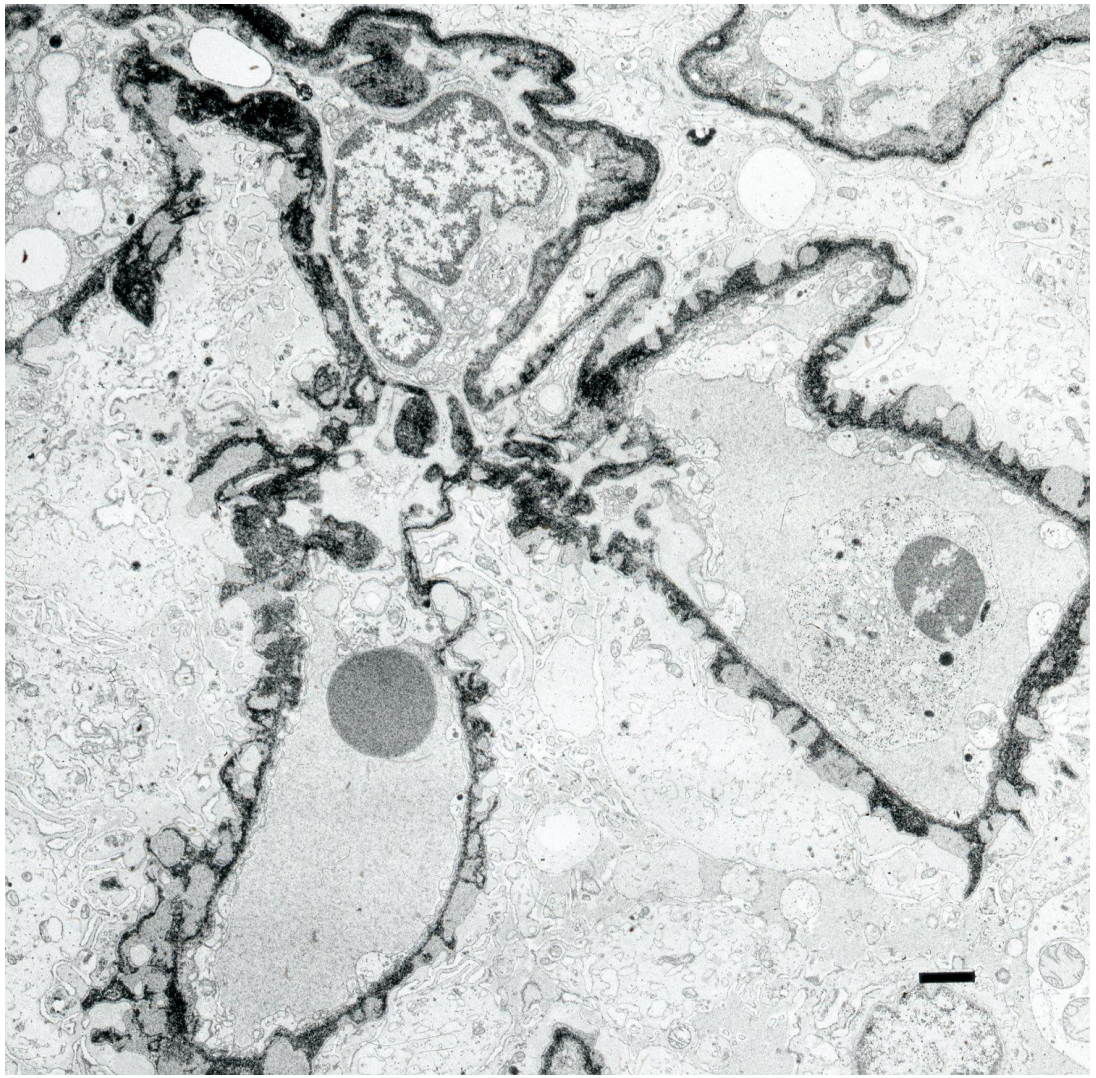
Ultrastructure of IgA nephropathy (IgAN) with a mesangioproliferative glomerulonephritis (MPGN) pattern. Electron-dense deposits are seen in the mesangial matrix. Mesangial cell growth is so marked to result in mesangial interposition beneath the endothelial cells.



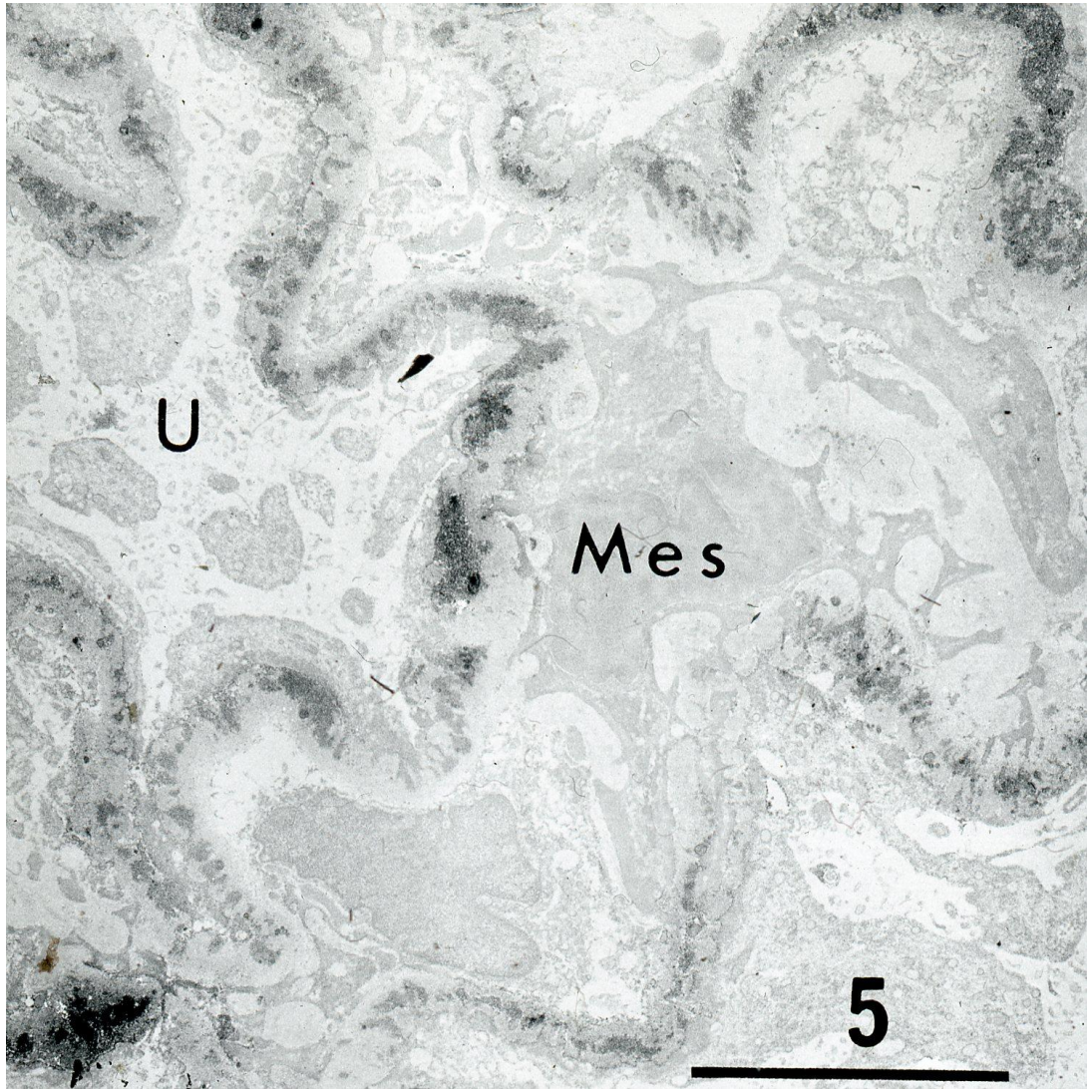
Ultrastructure of membranous nephropathy (MN). Electron-dense granular deposits are seen in the subepithelial space along the capillary loop. Mesangial cell growth is absent. The foot processes are fused.



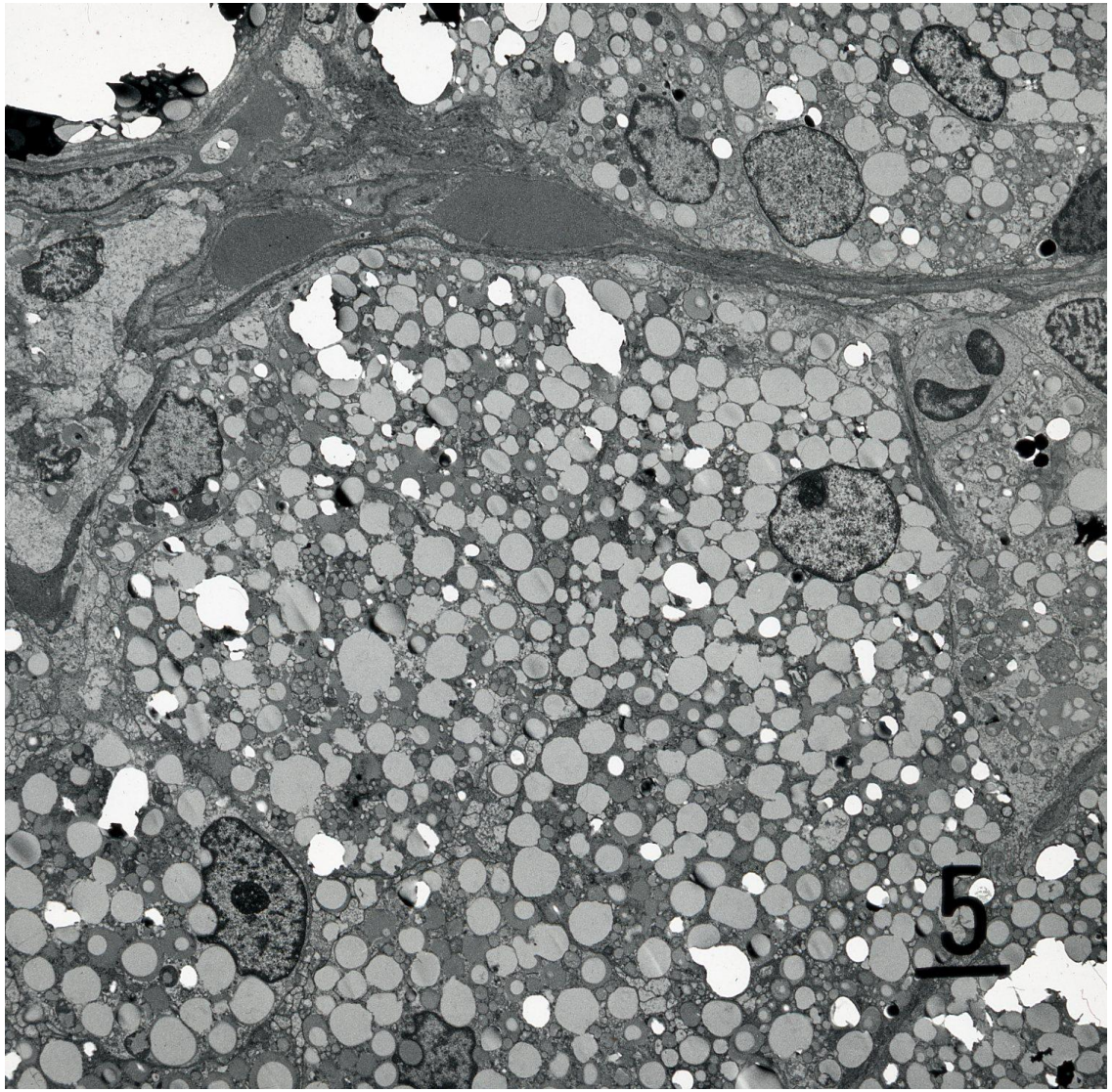
Ultrastructure of membranous nephropathy (MN). Electron-dense granular deposits are seen in the subepithelial space along the capillary loop. Mesangial cell growth is absent. The foot processes are fused.



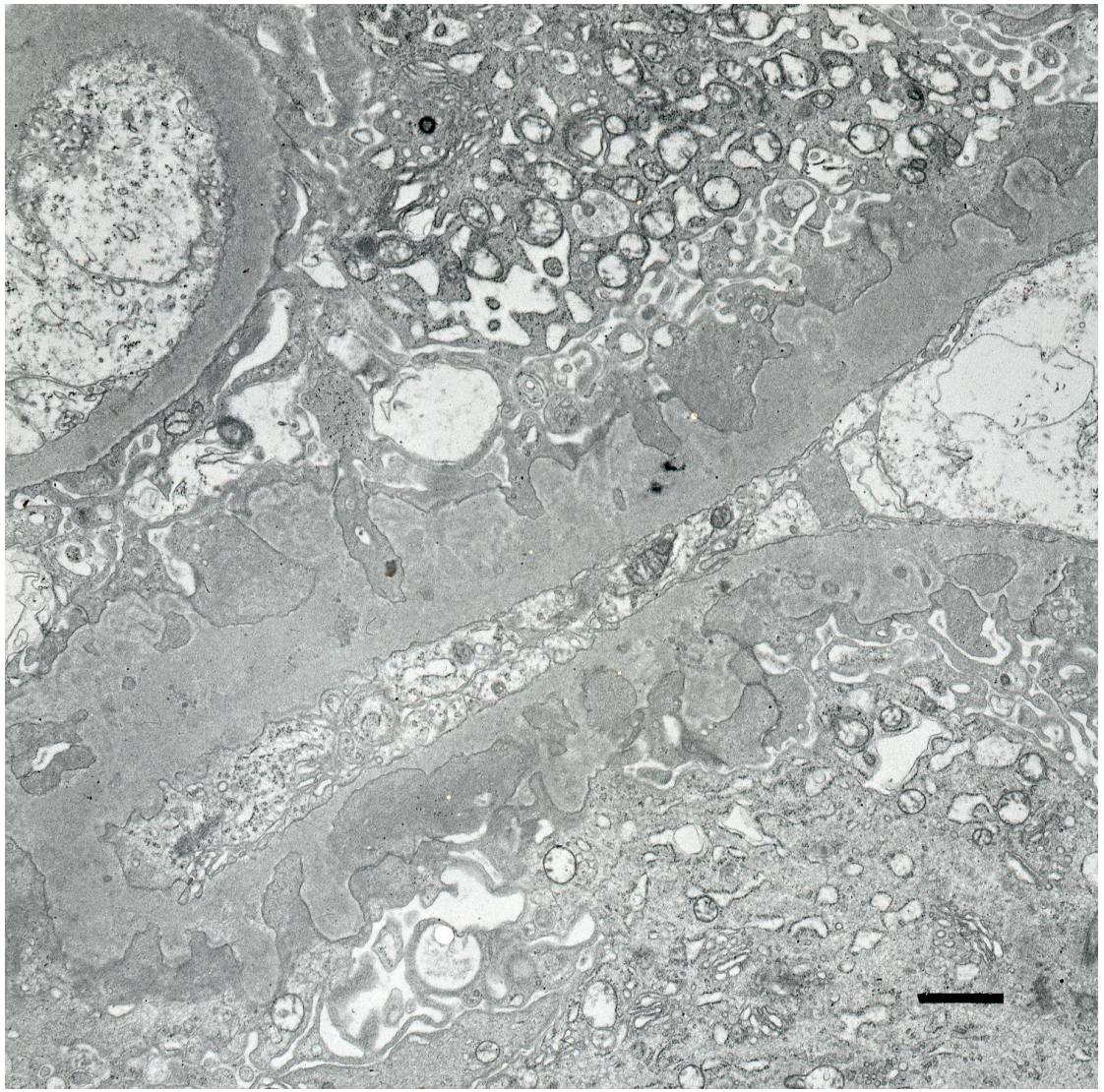
Ultrastructure of membranous nephropathy (MN). PAM staining at the EM level discloses spike formation along the capillary loop. Immune deposits are located between the PAM-reactive spikes.



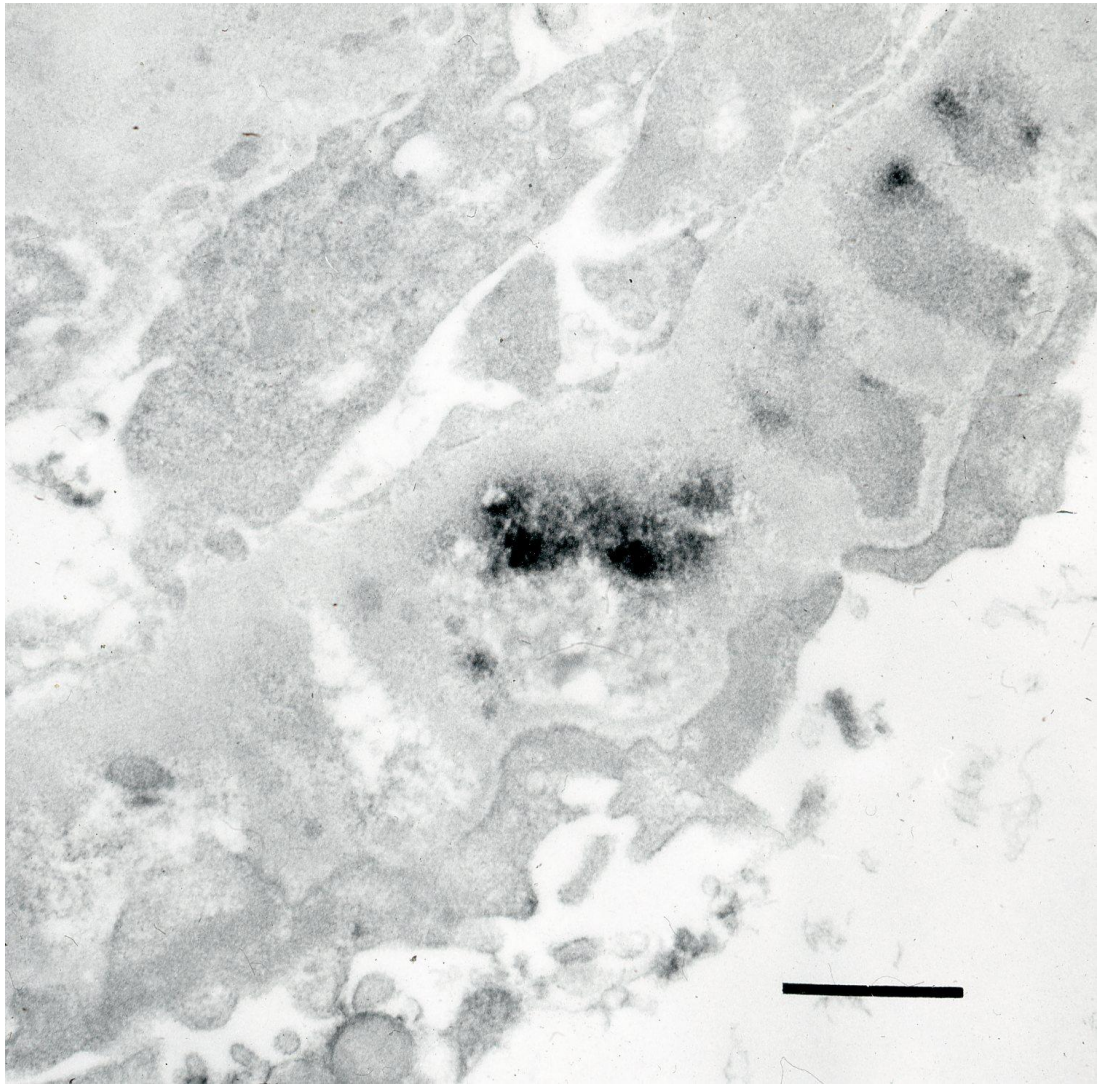
Ultrastructure of membranous nephropathy (MN). Immunoelectron microscopy (pre-embedding method) for IgG discloses subepithelial IgG deposits along the outer zone of the glomerular basement membrane. Mes: mesangial cell, U: urinary space



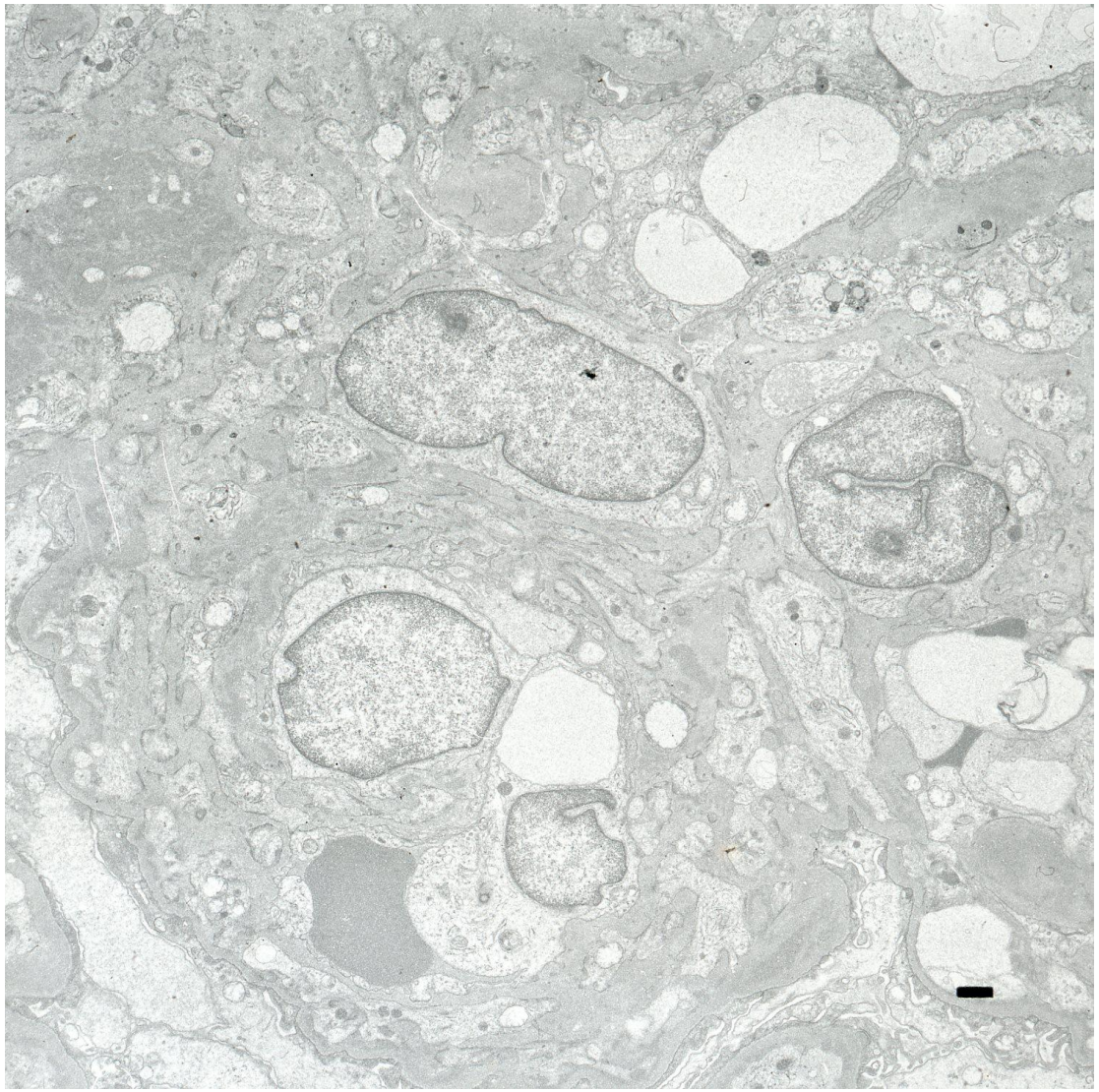
Ultrastructure of membranous nephropathy (MN). Fat droplets are accumulated in the cytoplasm of the proximal renal tubular epithelial cells. This represents re-absorbed fat component due to nephrotic syndrome.



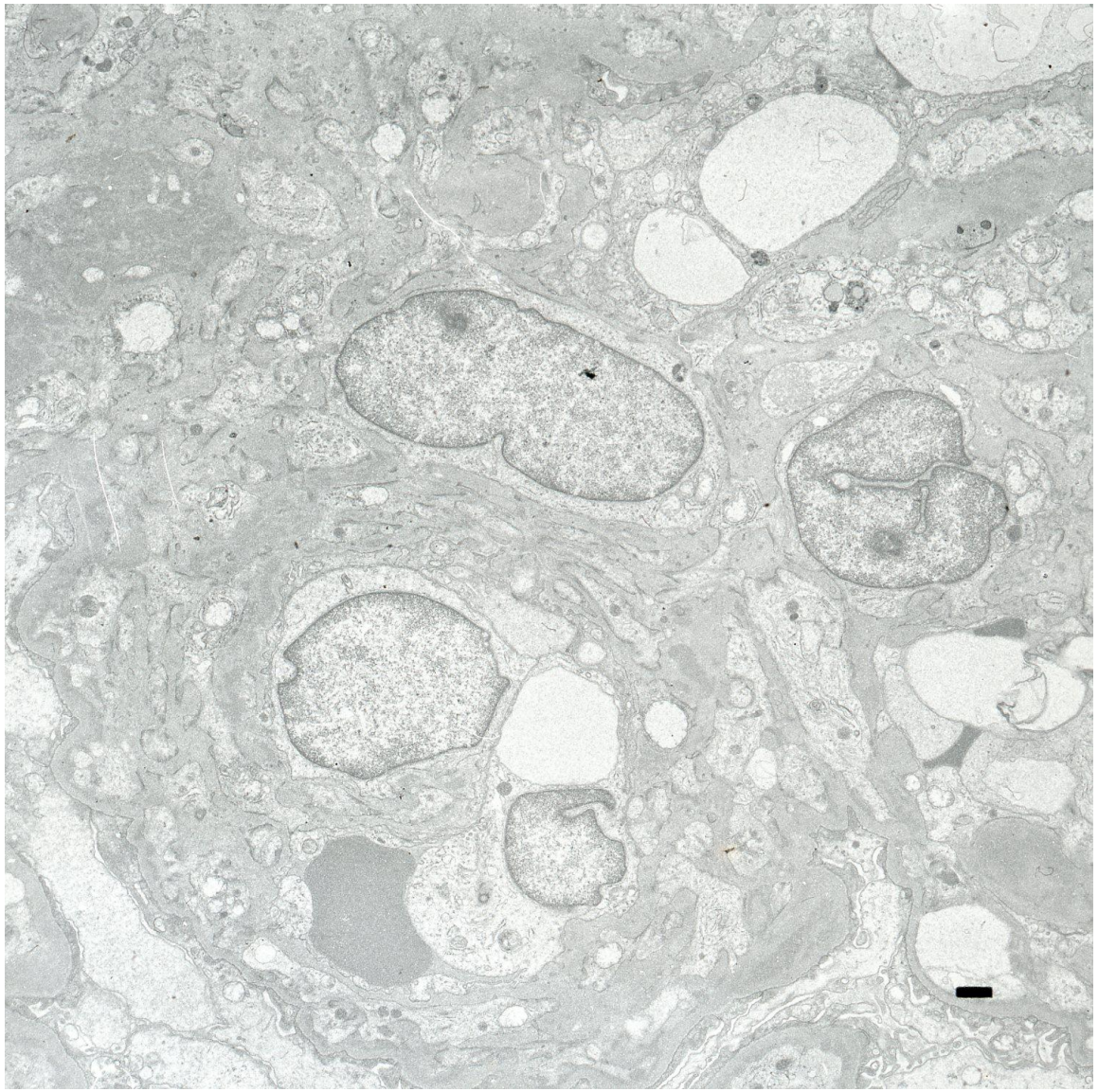
Ultrastructure of membranous nephropathy (MN) related to HBs immune reactions. Electron-dense granular deposits are seen in the subepithelial space along the capillary loop. The foot processes are fused.



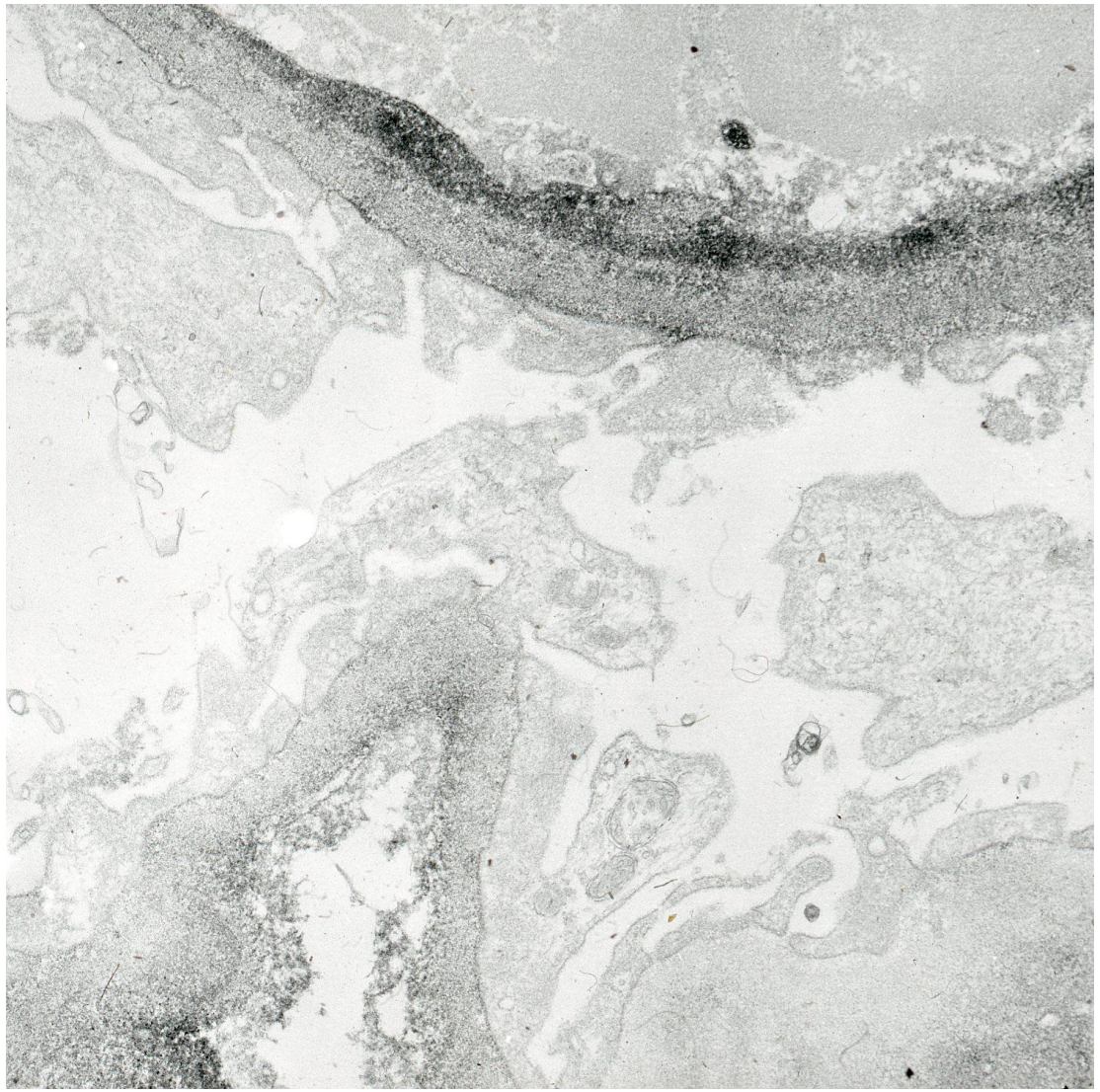
Ultrastructure of membranous nephropathy (MN) related to HBs immune reactions. Immunoelectron microscopy (pre-embedding method) for HBs antigen demonstrates deposition of HBs antigen in the granular deposits seen in the subepithelial space along the capillary loop.



Ultrastructure of membranoproliferative glomerulonephritis (MPGN). Mesangiocellular growth is active. Mildly electron-dense deposits are seen in the subendothelial space. The foot processes are fused.

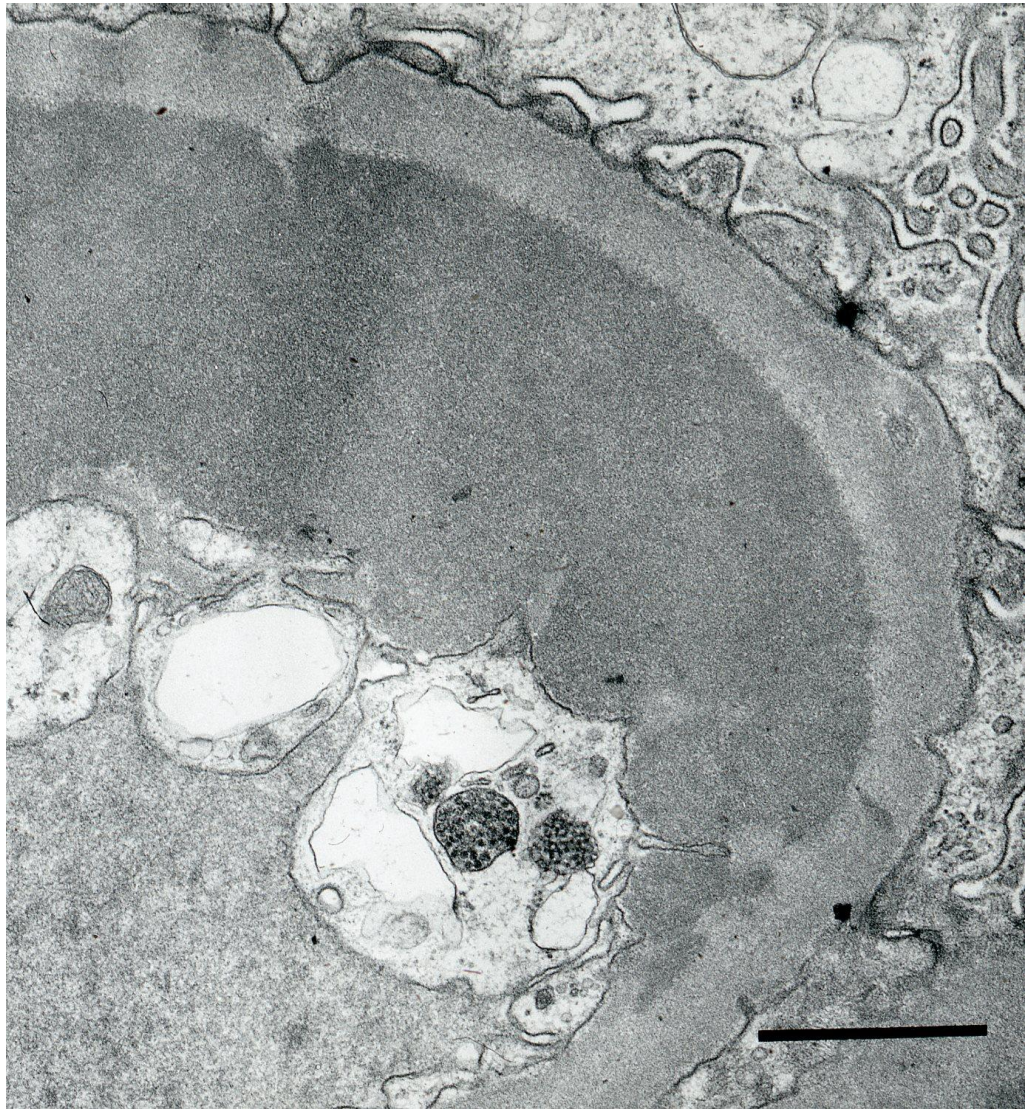


Ultrastructure of membranoproliferative glomerulonephritis (MPGN). Mesangiocellular growth is active. Mesangial cells interposed between the endothelial cells and capillary basement membrane (mesangial interposition), representing tram track formation.

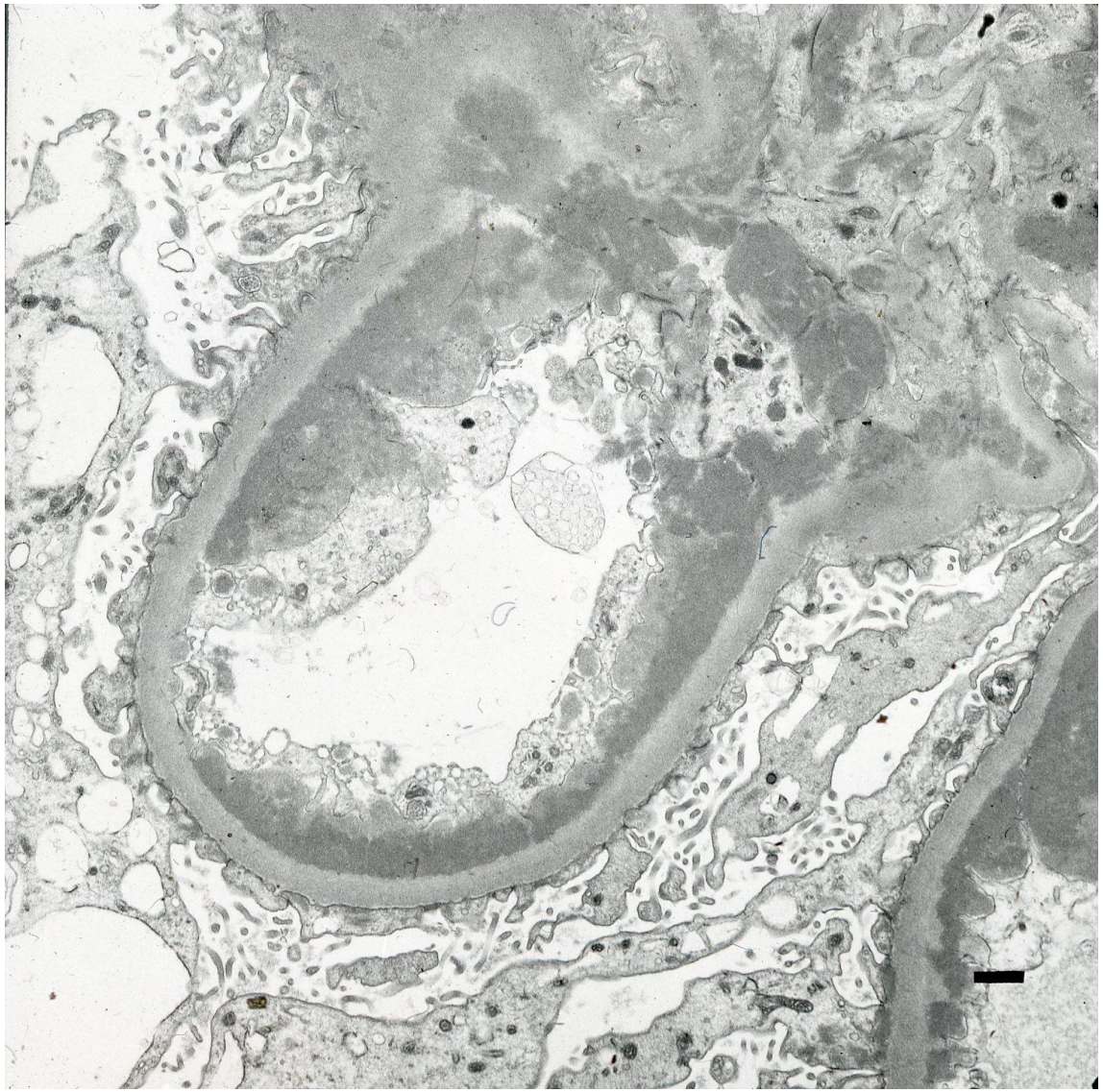


Ultrastructure of membranoproliferative glomerulonephritis (MPGN). Immunoelectron microscopy (pre-embedding method) for IgM discloses subendothelial IgM deposits along the glomerular basement membrane.

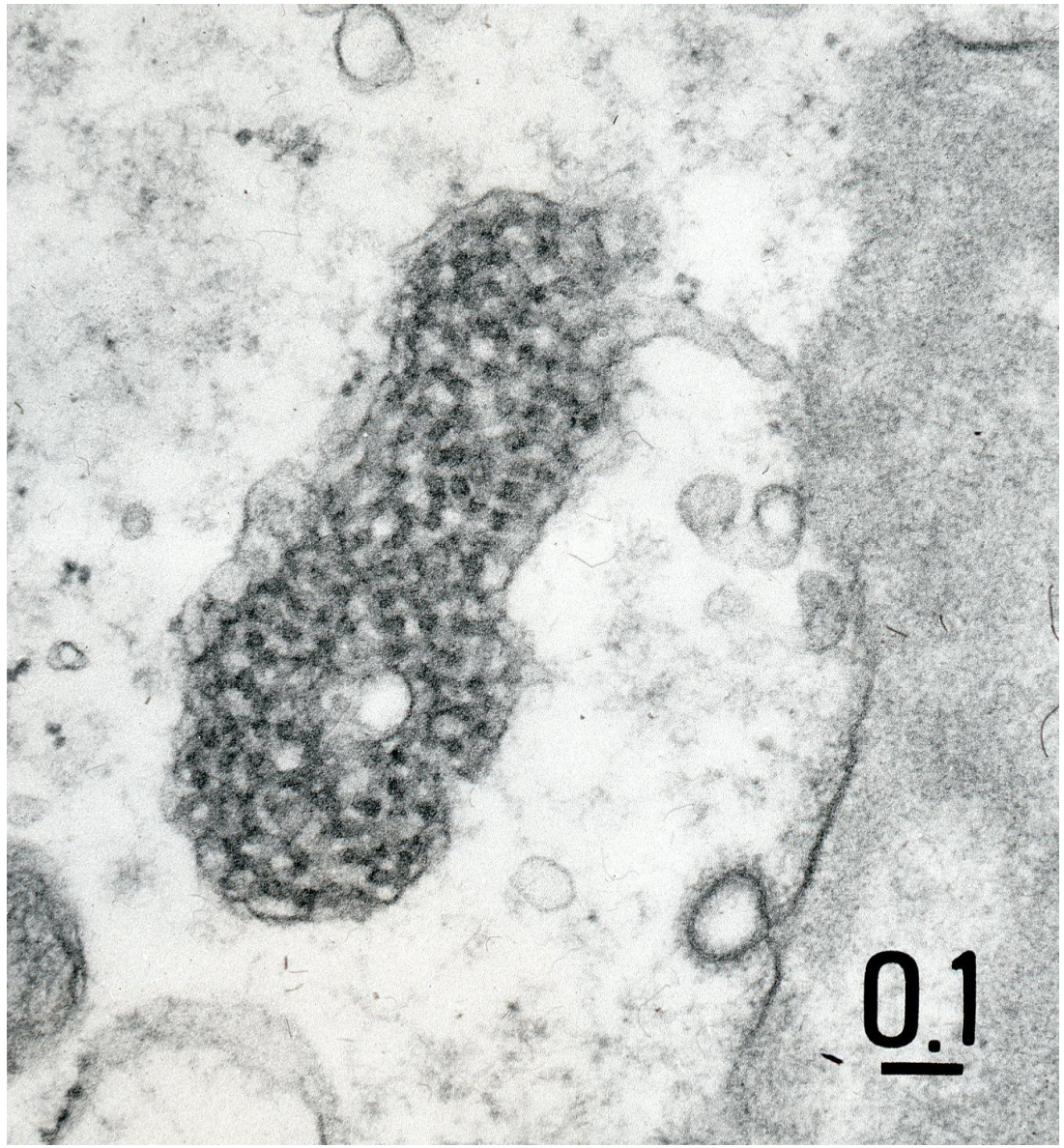
36F, wire loop lesion



Ultrastructure of lupus nephritis with wire loop lesion. Massive deposition of electron-dense materials is seen in the subendothelial space. Viral virion-like structures are seen in the cytoplasm of the endothelial cells. The foot processes are fused.

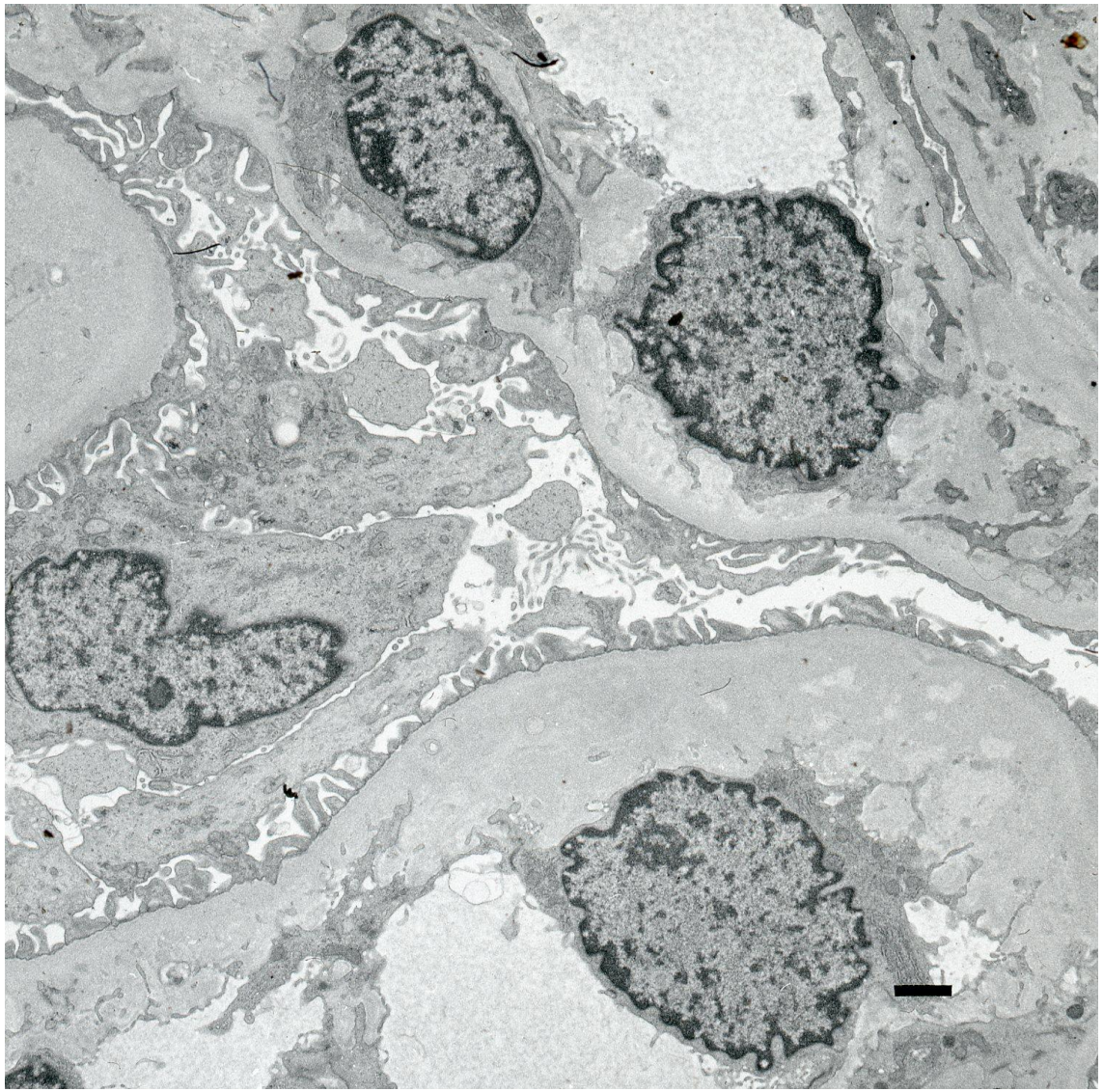


Ultrastructure of lupus nephritis with wire loop lesion. Massive deposition of electron-dense materials is seen in the subendothelial space and also in the mesangial matrix. The foot processes are fused.

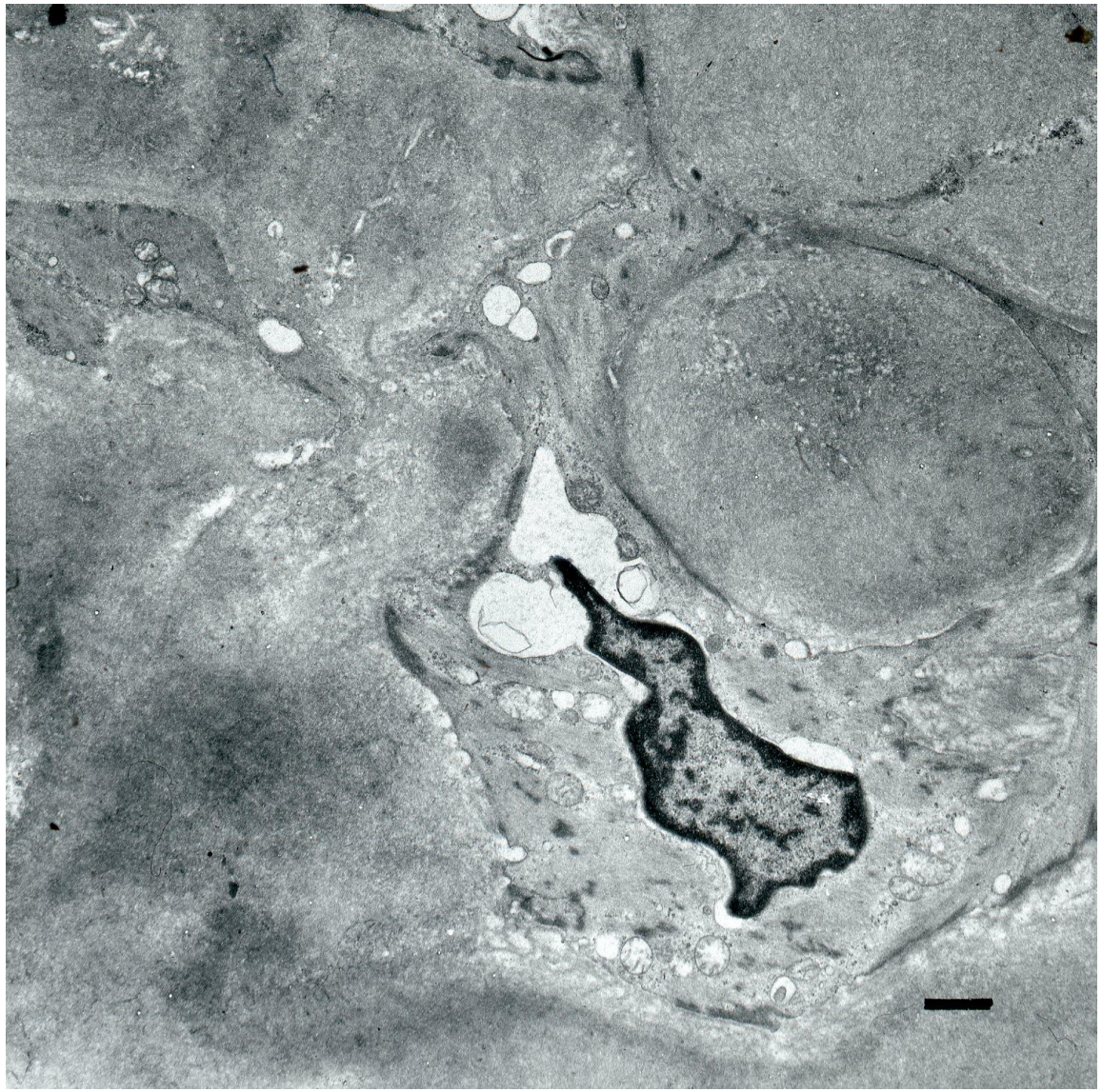


Ultrastructure of lupus nephritis with wire loop lesion. Viral virion-like structures (tubuloreticular inclusions) are clustered in the cytoplasm of the endothelial cells, a diagnostic feature of lupus nephritis.

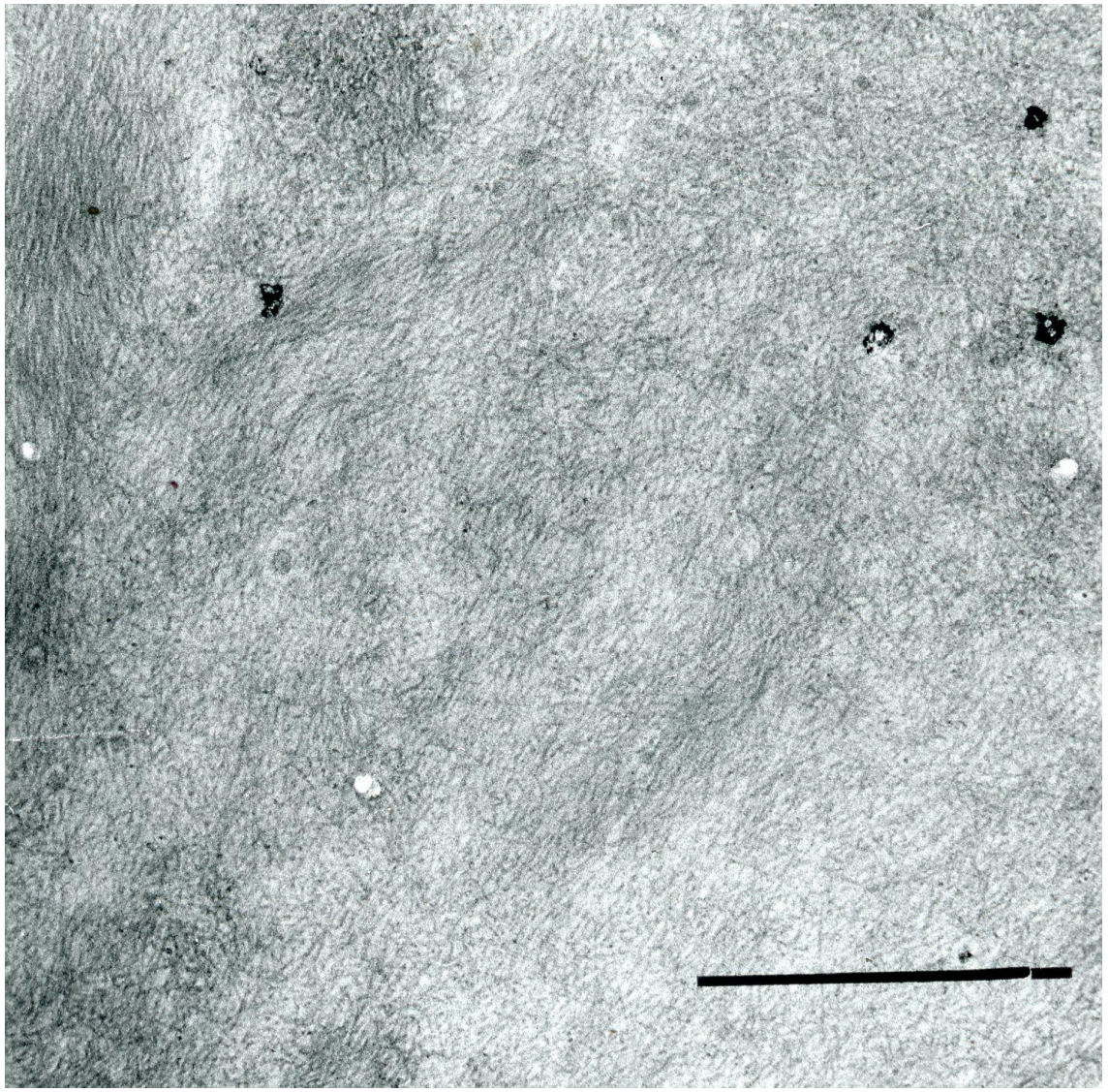
preeclampsia



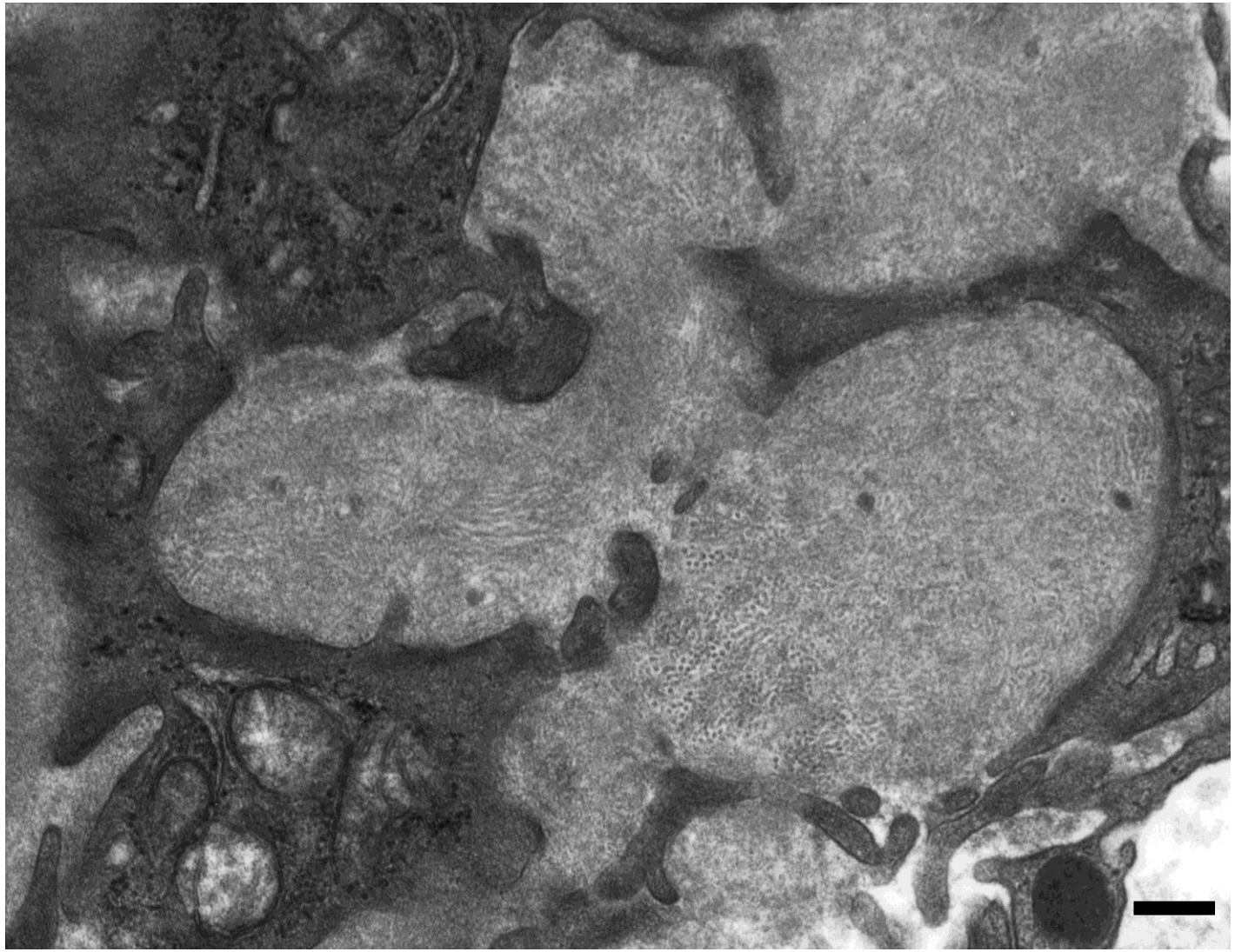
Ultrastructure of nephropathy in preeclampsia (toxemia of pregnancy). Endothelial cells are swollen, and the subendothelial space is diffusely thickened. Glomerular capillary endotheliosis is a feature of preeclampsia nephropathy.



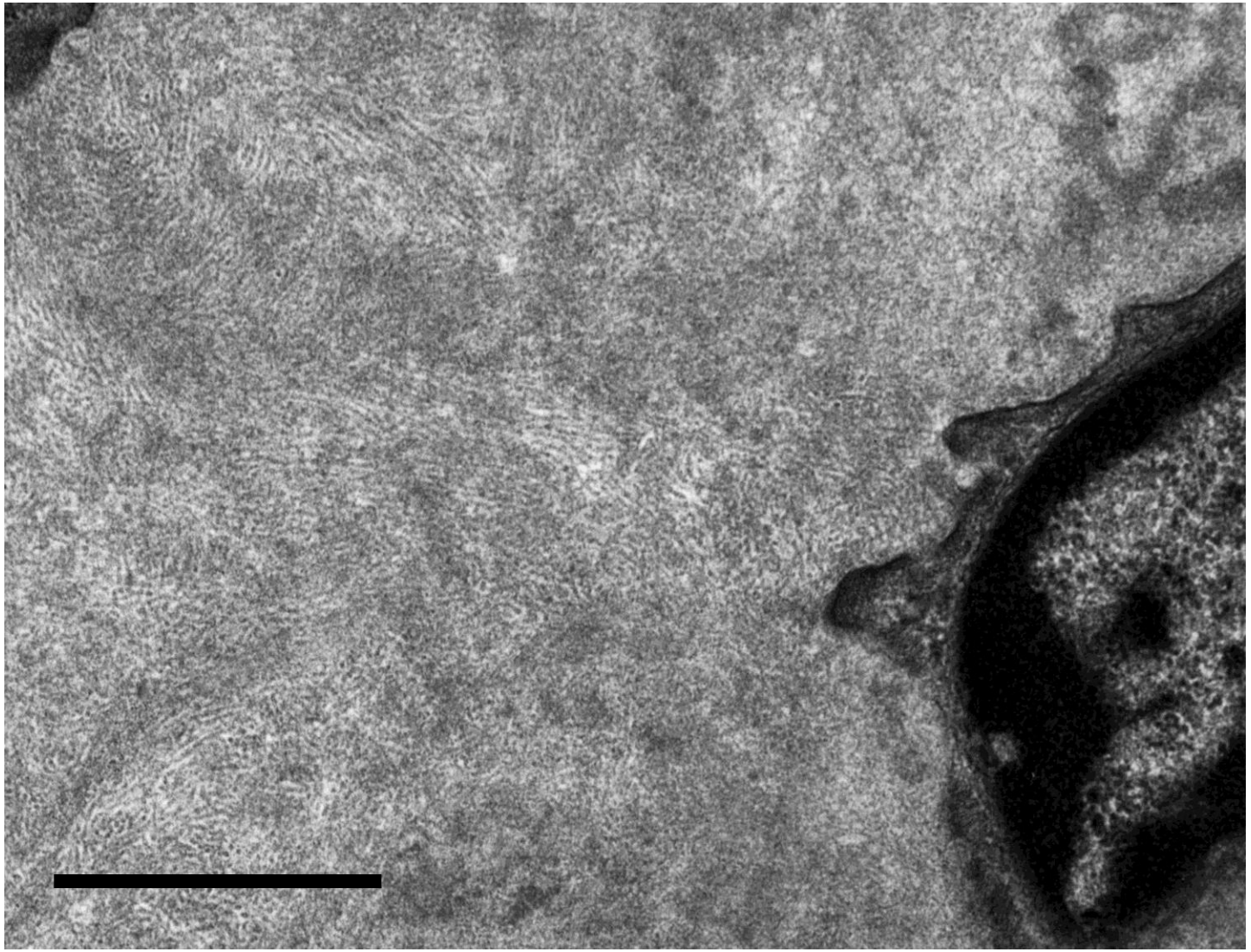
Ultrastructure of amyloid nephropathy. Massive deposition of fine filamentous substances is seen in the mesangial matrix.



Ultrastructure of amyloid nephropathy. Massive deposition of fine non-branching filamentous substances about 10 nm thickness is seen in the mesangial matrix.

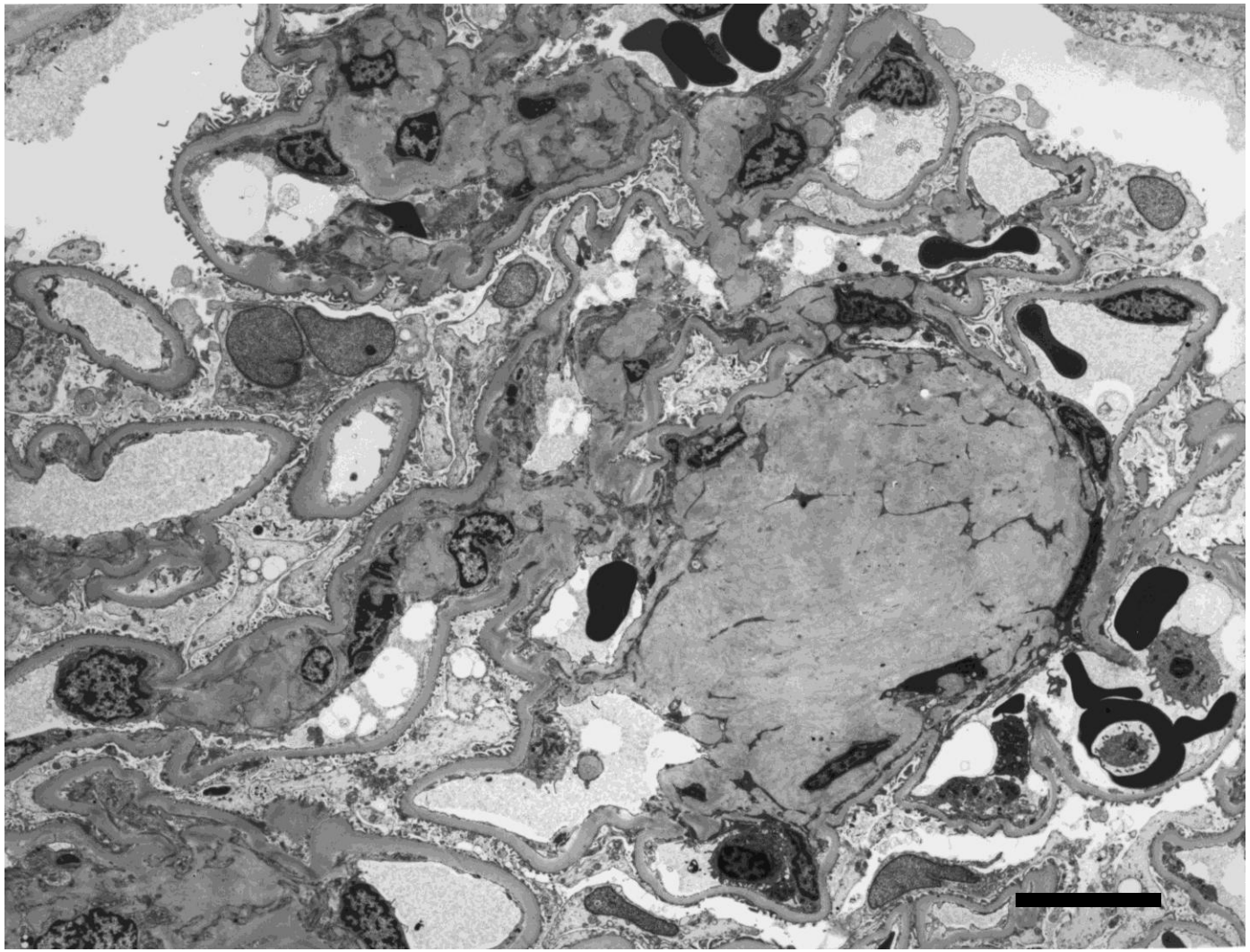


Ultrastructure of light chain deposition disease associated with macroglobulinemia. Deposition of short filamentous and finely granular material is seen in the mesangial matrix.

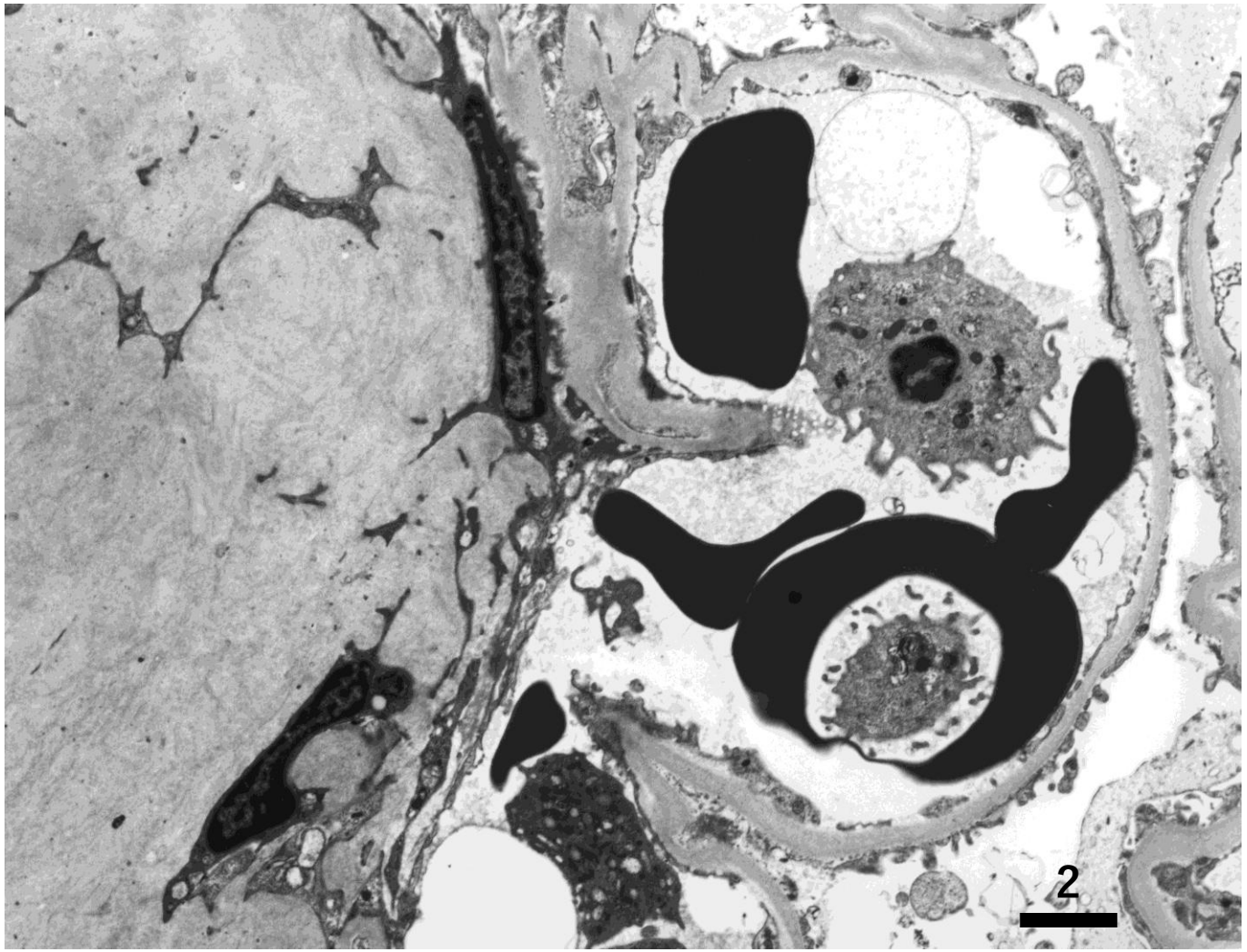


Ultrastructure of light chain deposition disease associated with macroglobulinemia. Deposition of short filamentous and finely granular material is seen in the mesangial matrix.

69M, diabetic GS



Ultrastructure of diabetic glomerulosclerosis. Focal accumulation of collagen fibrils corresponds to the nodular lesion. Foot processes are fused.



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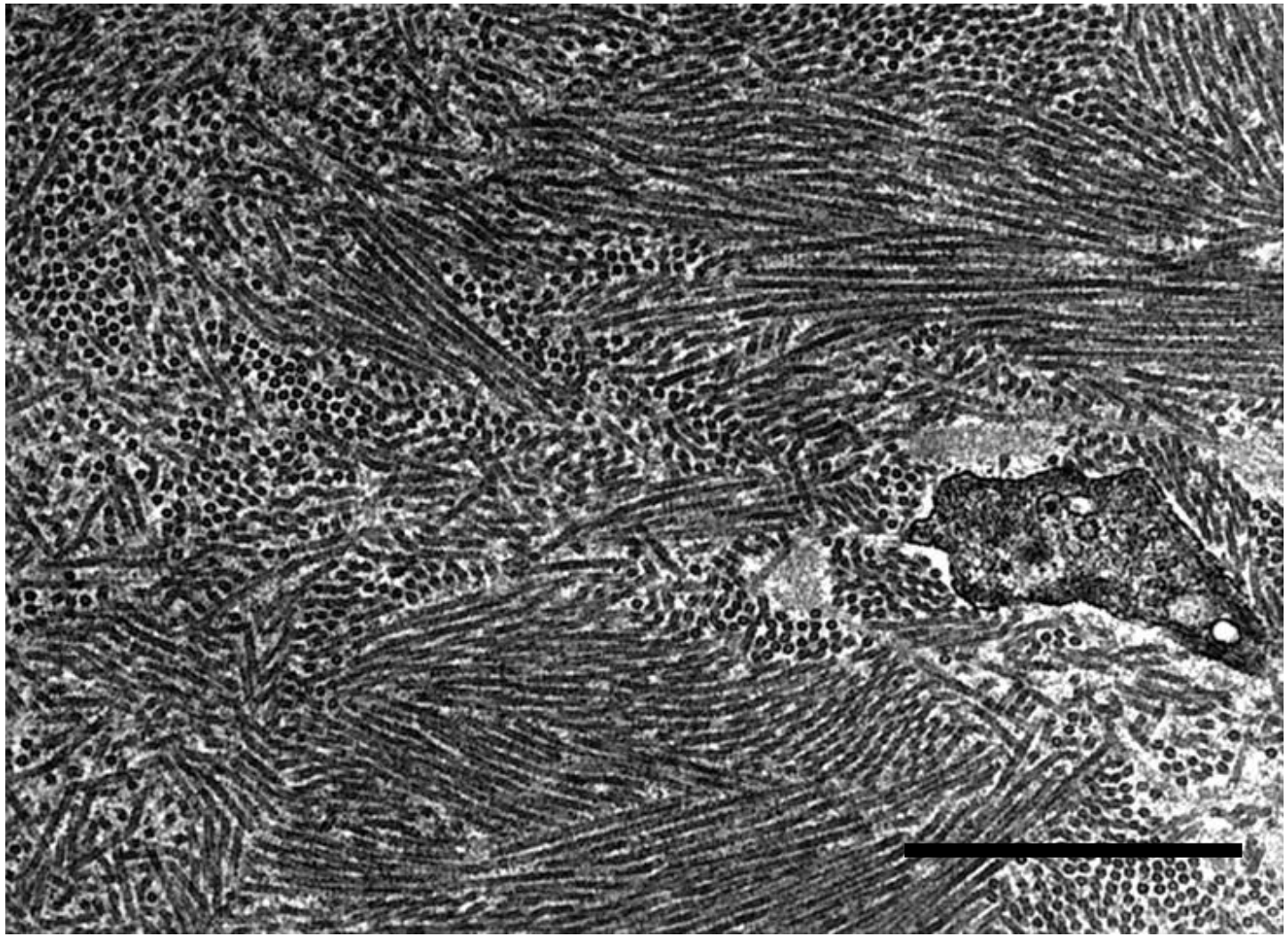
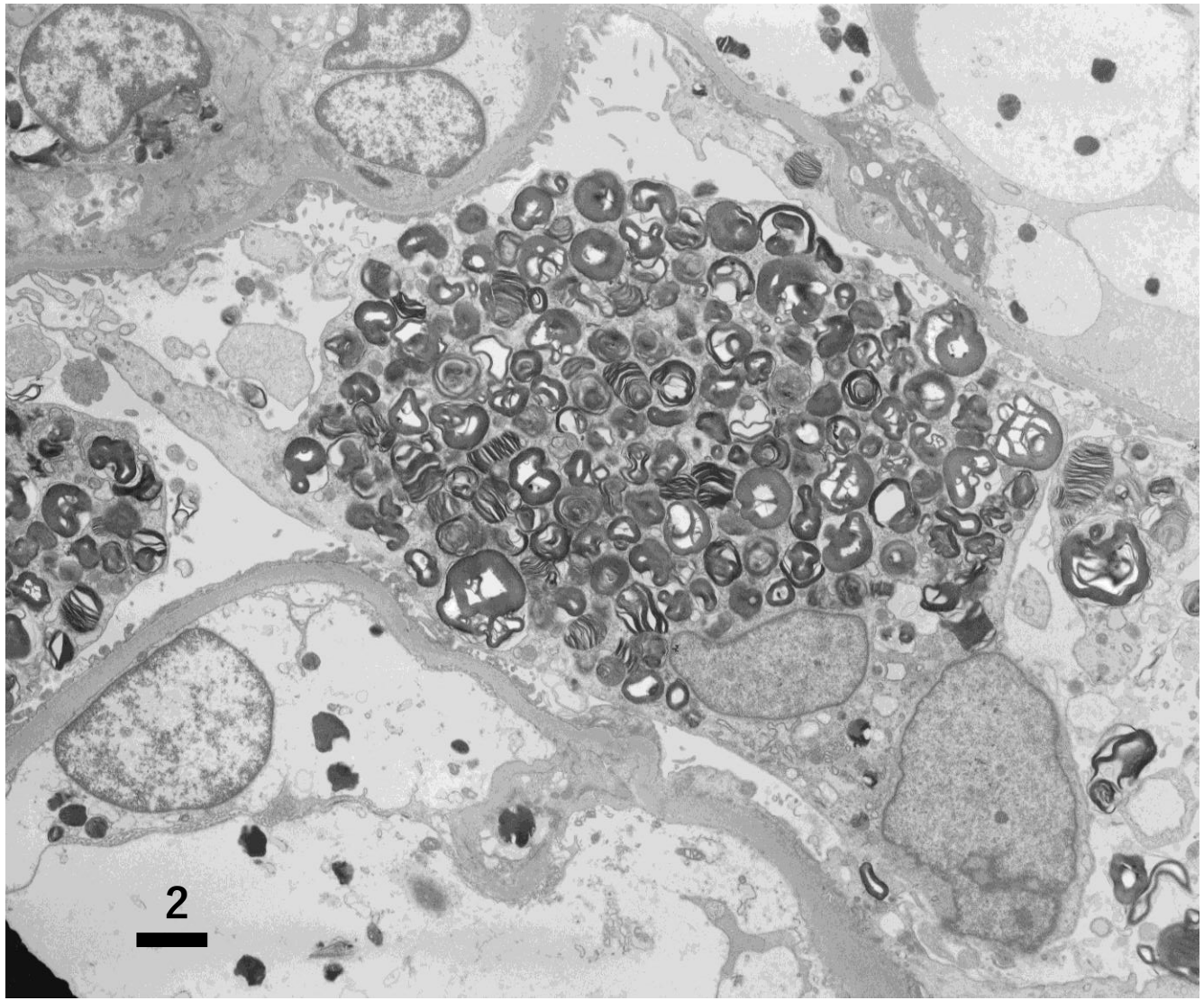
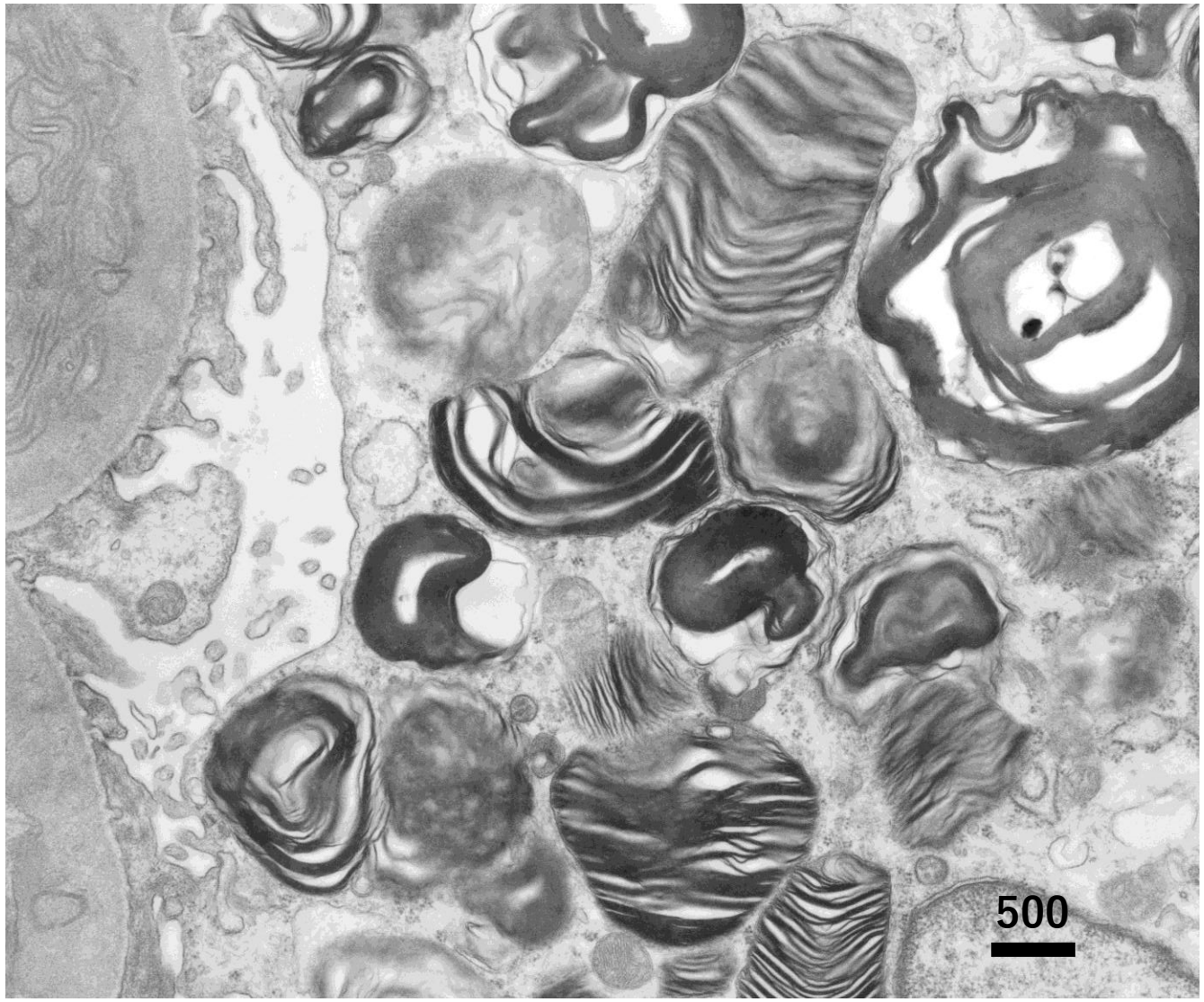


Ultrastructure of immunotactoid glomerulopathy. The patient often has monoclonal serum paraprotein and lymphoplasmacytic malignancy. Microtubular deposits, 35 nm in diameter, with a parallel and packed arrangement are observed in the mesangial matrix.



Ultrastructure of Fabry's disease, an X-linked lysosomal storage disease caused by deficiency of alpha-galactosidase A. The cytoplasm of the epithelial cells is filled with zebra inclusion bodies.



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