Laminin alpha 1 is essential for mouse glomerular maturity

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Laminin alpha 1 (Lama1), a subunit of laminin-1 (Lam-111) and a heterotrimeric extracellular matrix protein, has various biological functions in vivo and in vitro. However, the role of Lama1 in organogenesis and adult tissue functions is still unclear. In this study, we aimed to identify the role of Lama1 in kidney development and function. Lama1 is transiently expressed in the glomerular basement membrane at various developmental stages and in the mesangial cell matrix of the mature kidney glomerulus. We analyzed morphological deficiency in kidneys of 30-week-old Lama1 conditional knockout mice (Lama1CKO). The deficiency in Lama1 caused decreases in kidney wet weights/BW in the number and areas of glomeruli and in the capillary space of the glomerulus, when compared to control mice. The number of mesangial cells was also increased in Lama1-deficient glomeruli compared to those of control mice. Seven of twelve Lama1CKO mice developed albuminuria, whereas control mice had little albuminuria. These results suggest that Lama1 is essential for the maturation of the glomerulus and function in mouse kidney.