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The primary cilium is necessary for the differentiation into myofibroblast in TGF- β 1-treated fibroblast.

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Objectives:

The primary cilium is an organelle, present at the cell surface and plays a role of an antenna. In addition to the signaling function of chemical stimulation essential for the maintenance of the structure and function of the kidney, it has been found that the primary cilium mediates cell proliferation, differentiation, death, planar cell polarity, and the like. TGF- β 1 is well identified as a central mediator in renal fibrosis. This study was investigated the effect of fibroblast-myofibroblast transdifferentiation caused by TGF- β 1 on primary cilium and to clarify the fundamental mechanism and results.

Methods:

NRK-49F cells were differentiated into myofibroblasts when treated with TGF- β 1. Using immunocytochemistry staining and western blot, the primary cilium and the fibroblast-myofibroblast transdifferentiation in NRK-49F cells was measured.

Results: The primary cilium maintained a signaling activity during differentiation of fibroblast into myofibroblasts. Knock-down of Arl13b and IFT88 decreased expression of α -SMA, p-smad3 and smad4. TGF- β 1 receptors localized to the primary cilium in NRK-49F cells.

Conclusions: we provide evidence that the primary cilium is necessary both for the differentiation of fibroblast into myofibroblasts and the maintenance of the phenotype.