Table S1 Real-time PCR primers

Gene	Forward primer	Reverse primer
α-SMA	5’-CGTACAACTGGTATTGTGCTGGAC-3’	5’-TGATGTCACGGACAATCTCACGCT-3’
vimentin	5’-CGTCCACACGCACCTACAG-3’	5’-GGGGGATGAGGAATAGAGGCT-3’
Snail2	5’-TGGTCAAGAAACATTTCAACGCC-3’	5’-GGTGAGGATCTCTGGTTTTG GTA-3’
E-cadherin	5’-CAGGTCTCCTCATGGCTTTGC-3’	5’-CTTCCGAAAAGAAGGCT GTCC-3’
Twist1	5’-GGACAAGCTGAGCAAGATTCA-3’	5’-CGGAGAAGGCGTAGCTGAG-3’
TGFβ1	5’-CCGCAACAACGCCATCTATG-3’	5’-CTCTGCACGGGACAGCAA T-3’
TβRI	5’-TCCCAACTACAGGACCTTTTT CA-3’	5’-GCAGTGGTAAACCTGATCCAGA-3’
TβRII	5’-ATGGAAGAGTGCAACGATTACAT-3’	5’-TGGCGCAGTTGT CACTGAAAT-3’
P311	5’-GAGGCTTCCTAAGGGAAGACTT-3’	5’-AAGTGGAGGTAACTGATTCTTGG-3’
GAPDH	5’-CGTGCCGCCTGGAGAAAC-3’	5’-AGTGGGAGTTGCTGTTGAAGTC-3’
HPRT	5’-TCAGTCAACGGGGGACATAAA-3’	5’-GGGGCTGTACTGCTTAACCAG-3’.

TableS2 The characterization of epithelial to myofibroblast/myofibroblast-like cell transdifferentiation in 36 articles

Authors, year	Treatment	Epithelial cell type	Mesenchymal cell type	Phenotype		Function		
				Up-regulation	Down-regulation	Migration	Contraction	ECM
(Zhang et al., 2015)	IL-1alpha	kidney tubular epithelial cells(NRK52E)	myofibroblasts	elongated and fusiform-shaped cells. α-SMA and TGF-β1		-	-	-
(Xiao et al., 2015)	miR-424	lung epithelial cell	myofibroblasts	Increased α-SMA, TGF-β1	no effects on the epithelial or mesenchymal cell markers	-	-	-
(Thakur et al., 2015)	TGF-β1	kidney tubular epithelial cells	myofibroblasts	Increased α-SMA	E-cadherin	-	-	increased fibronectin
(O'Connor et al., 2015)	Matrix Rigidity , TGFβ1	Normal murine mammary gland (NMuMG) epithelial cells	myofibroblasts	myofibroblast marker expression, cell morphology changes, and cytoskeletal reorganization	-	-	-	-
(Liu et al., 2014)	hepatitis B virus	human renal tubular epithelial HK-2 cells	myofibroblasts	morphological changes α-SMA,TGF-β1	E-cadherin	-	-	-
(Lechuga et al., 2014)	gamma-CYA siRNA	Human alveolar epithelial cells	myofibroblasts	α-SMA and other contractile proteins	inhibition of genes responsible for cell proliferation	--	-	-
(O'Connor and Gomez, 2013)	(TGF)-β1	Mouse mammary gland epithelial cells(NMuMG cells)	myofibroblasts	α-SMA, caldesmon, and tropomyosin	-	-	-	-
(Gu et al., 2013)	high glucose Fasudil	human renal tubular epithelial (HK-2) cells	myofibroblasts	morphological changes vimentin and α-SMA, TGF-β1 and CTGF	E-cadherin	-	-	-

(Sun et al., 2012)	EGF	GM16 cells	myofibroblasts	Vimentin, and α-SMA	-	-	-	fibronectin
(Zhou et al., 2011)	*MeCP2* TGFβ1	lens epithelial cell	myofibroblasts	α-SMA	-	-	-	-
(Liu et al., 2011b)	(IL-1β) and oncostatin M	human renal proximal tubular epithelial cells	myofibroblasts	α-SMA,	CK18 expression	-	-	collagen type I and FN expression
(Liu et al., 2011a)	anaphylatoxin C3a, C5a	human renal tubular epithelial (HK-2) cells	myofibroblasts	α-SMA, a slightly spindle-like shape and loss of microvilli on the cell surface.	E-cadherin	-	-	Increased Col-I, TGF-β1 and CTGF
(Charbonney et al., 2011)	Contact injury and TGFb	LLC-PK1 (Cl 4) cells, a porcine proximal tubular epithelial cell line	myofibroblasts	α-SMA,	E-cadherin	-	-	-
(Aoyagi-Ikeda et al., 2011)	NICD	rat alveolar epithelial cells (RLE-6TN cells)	myofibroblasts	α-SMA,ZO1,VIMENTIN,	E-cadherin,occludin	Increased	-	Collagen I
(Xie et al., 2009)	ginsenoside Rg1, TGFb1	kidney tubular epithelial cells(NRK52E)	myofibroblasts	α-SMA,	E-cadherin	-	-	Collagen I and fibronectin
(Shukla et al., 2009)	Hepatocyte growth factor, TGFb1	Rat alveolar epithelial cells	myofibroblasts	α-SMA,	E-cadherin	-	-	Collagen I and fibronectin
(Li et al., 2009)	Hydraulic pressure	kidney tubular epithelial cells(NRK52E)	myofibroblasts	Cell shape, F actin, α-SMA	-	-	-	-
(Kim et	α3β1	In vivo lung	myofibroblasts	α-SMA	proSPC	-	-	Collagen I

al., 2009)	integrin			coexpression of GFP with SMA/vimentin /collagen I in transgenic mice				
(Sebe et al., 2008)	TGF b1	porcine proximal tubular cells (LLC-PK/AT1)	myofibroblasts	α-SMA	-	-	-	-
(Fan et al., 2007)	TGFb1,Ca^{2+}	LLC-PK1 (CL4) proximal tubular cells	myofibroblasts	α-SMA	-	-	-	-
(Forino et al., 2006)	TGFβ1	human tubular epithelial cells (HUTECs)	Mesenchymal cells , not myofibroblasts	Cell shape, vimentin, and α-SMA.	Cytokeratin, E-cadherin	-	-	CTGF, cadherin 11, collagen III, fibronectin, tenascin and MMP-2)
(Sommer et al., 2005)	TGFβ1 TNFα	Renal tubular epithelial cells	myofi broblast-like cells (MFLC)	Cell shape	-	-	-	-
(Barth et al., 2005)	Bleomycin	alveolar epithelial cell lines R3/1 and L2	myofibroblasts	vimentin, α-SMA and caveolin-3	E-cadherin, aquaporin-5 and cytokeratin 8)	-	-	collagen I/III, fibronectin, Desmin,MMP -2
(Zhang et al., 2004b) (Zhang et al., 2004a)	TGFβ1 CTGF	human proximal tubular epithelial cell line (HKC	myofibroblasts	α-SMA	collagen IV	-	-	Fibronectin , plasminogen activator inhibitor-1(P AI-1) ,tenasci n-C

(Nightingale et al., 2004)	oncostatin M	human proximal tubular epithelial cells	myofibroblasts	α-SMA	E-cadherin, cytokeratin 19	-	-	collagen I, and fibronectin EDA
(Masszi et al., 2004)	TGFβ1 Cell contact	LLC-PK1 (CL4) proximal tubular cells	myofibroblasts	α-SMA	E-cadherin	-	-	fibronectin
(Li et al., 2004)	Advanced glycation end products (AGEs)	(NRK52E)	myofibroblasts	α-SMA	E-cadherin	-	-	collagen I and fibronectin
(Kim et al., 2004)	serum	lens epithelial cells	myofibroblasts	Cell shape, α-SMA	crystallin	Increased migration ,decreased adhesion	-	collagen I and fibronectin
(Yang and Liu, 2002)	TGFβ1 HGF	Human proximal tubular epithelial HKC cells	myofibroblasts	Cell shape, α-SMA,F-actin, Vimentin	E-cadherin	-	-	fibronectin
(Yang and Liu, 2001)	TGFβ1	Human proximal tubular epithelial HKC cells	myofibroblasts	α-SMA, F-actin	E-cadherin	Enhanced Motility and Invasive Capacity	-	*MMP-2*
(Oldfield et al., 2001)	TGFβ1 Advanced glycation end products (AGEs)	NRK-52E	myofibroblasts	α-SMA	E-cadherin	-	-	-

(Morishima et al., 2001)	(TGF)-b1 and thrombospondin (TSP)-1	Airway epithelial cells	myofibroblasts	α-SMA	-	-	-	procollagen type I and III
(Fan et al., 2001)	IL 1	NRK-52E	myofibroblasts	α-SMA, Morphological changes as a loss of apical-basal polarity and microvilli, cell hypertrophy, and the development of an elongated and invasive appearance.	E-cadherin	-	-	-
(Fan et al., 1999)	TGF β1	NRK-52E	myofibroblasts	α-SMA, Cell shape	E-cadherin, double positive by IHC	-	-	-
(Lee and Joo, 1999)	TGF-β1	lens epithelial cells	Mesenchymal cells	α-SMA	-	-	-	collagen I and fibronectin

Note: '-' represented not detected.

References:

1. Aoyagi-Ikeda, K., Maeno, T., Matsui, H., Ueno, M., Hara, K., Aoki, Y., Aoki, F., Shimizu, T., Doi, H., Kawai-Kowase, K*., et al.* (2011). Notch induces myofibroblast differentiation of alveolar epithelial cells via transforming growth factor-{β}-Smad3 pathway. American journal of respiratory cell and molecular biology *45*, 136-144.
2. Barth, K., Reh, J., Sturrock, A., and Kasper, M. (2005). Epithelial vs myofibroblast differentiation in immortal rat lung cell lines--modulating effects of bleomycin. Histochemistry and cell biology *124*, 453-464.
3. Charbonney, E., Speight, P., Masszi, A., Nakano, H., and Kapus, A. (2011). beta-catenin and Smad3 regulate the activity and stability of myocardin-related transcription factor during epithelial-myofibroblast transition. Molecular biology of the cell *22*, 4472-4485.
4. Fan, J.M., Huang, X.R., Ng, Y.Y., Nikolic-Paterson, D.J., Mu, W., Atkins, R.C., and Lan, H.Y. (2001). Interleukin-1 induces tubular epithelial-myofibroblast transdifferentiation through a transforming growth factor-beta1-dependent mechanism in vitro. American journal of kidney diseases : the official journal of the National Kidney Foundation *37*, 820-831.
5. Fan, J.M., Ng, Y.Y., Hill, P.A., Nikolic-Paterson, D.J., Mu, W., Atkins, R.C., and Lan, H.Y. (1999). Transforming growth factor-beta regulates tubular epithelial-myofibroblast transdifferentiation in vitro. Kidney Int *56*, 1455-1467.
6. Fan, L., Sebe, A., Peterfi, Z., Masszi, A., Thirone, A.C., Rotstein, O.D., Nakano, H., McCulloch, C.A., Szaszi, K., Mucsi, I*., et al.* (2007). Cell contact-dependent regulation of epithelial-myofibroblast transition via the rho-rho kinase-phospho-myosin pathway. Molecular biology of the cell *18*, 1083-1097.
7. Forino, M., Torregrossa, R., Ceol, M., Murer, L., Della Vella, M., Del Prete, D., D'Angelo, A., and Anglani, F. (2006). TGFbeta1 induces epithelial-mesenchymal transition, but not

myofibroblast transdifferentiation of human kidney tubular epithelial cells in primary culture. International journal of experimental pathology *87*, 197-208.

8. Gu, L., Gao, Q., Ni, L., Wang, M., and Shen, F. (2013). Fasudil inhibits epithelial-myofibroblast transdifferentiation of human renal tubular epithelial HK-2 cells induced by high glucose. Chemical & pharmaceutical bulletin *61*, 688-694.
9. Kim, J.T., Lee, E.H., Chung, K.H., Kang, I.C., Lee, D.H., and Joo, C.K. (2004). Transdifferentiation of cultured bovine lens epithelial cells into myofibroblast-like cells by serum modulation. Yonsei medical journal *45*, 380-391.
10. Kim, K.K., Wei, Y., Szekeres, C., Kugler, M.C., Wolters, P.J., Hill, M.L., Frank, J.A., Brumwell, A.N., Wheeler, S.E., Kreidberg, J.A.*, et al.* (2009). Epithelial cell alpha3beta1 integrin links beta-catenin and Smad signaling to promote myofibroblast formation and pulmonary fibrosis. The Journal of clinical investigation *119*, 213-224.
11. Lechuga, S., Baranwal, S., Li, C., Naydenov, N.G., Kuemmerle, J.F., Dugina, V., Chaponnier, C., and Ivanov, A.I. (2014). Loss of gamma-cytoplasmic actin triggers myofibroblast transition of human epithelial cells. Molecular biology of the cell *25*, 3133-3146.
12. Lee, E.H., and Joo, C.K. (1999). Role of transforming growth factor-beta in transdifferentiation and fibrosis of lens epithelial cells. Investigative ophthalmology & visual science *40*, 2025-2032.
13. Li, F.Y., Xie, X.S., Fan, J.M., Li, Z., Wu, J., and Zheng, R. (2009). Hydraulic pressure inducing renal tubular epithelial-myofibroblast transdifferentiation in vitro. Journal of Zhejiang University Science B *10*, 659-667.
14. Li, J.H., Wang, W., Huang, X.R., Oldfield, M., Schmidt, A.M., Cooper, M.E., and Lan, H.Y. (2004). Advanced glycation end products induce tubular epithelial-myofibroblast transition through the RAGE-ERK1/2 MAP kinase signaling pathway. The American journal of pathology *164*, 1389-1397.
15. Liu, C., Chen, F., Han, X., Xu, H., and Wang, Y. (2014). Role of TGF-beta1/p38 MAPK pathway in hepatitis B virus-induced tubular epithelial-myofibroblast transdifferentiation. International journal of clinical and experimental pathology *7*, 7923-7930.
16. Liu, F., Gou, R., Huang, J., Fu, P., Chen, F., Fan, W.X., Huang, Y.Q., Zang, L., Wu, M., Qiu, H.Y.*, et al.* (2011a). Effect of anaphylatoxin C3a, C5a on the tubular epithelial-myofibroblast transdifferentiation in vitro. Chinese medical journal *124*, 4039-4045.
17. Liu, Q., Liu, S., Shi, Y., Li, H., Hao, J., Xing, L., Cao, Y., and Duan, H. (2011b). Suppressors of cytokine signaling inhibit tubular epithelial cell-myofibroblast transdifferentiation. American journal of nephrology *34*, 142-151.
18. Masszi, A., Fan, L., Rosivall, L., McCulloch, C.A., Rotstein, O.D., Mucsi, I., and Kapus, A. (2004). Integrity of cell-cell contacts is a critical regulator of TGF-beta 1-induced epithelial-to-myofibroblast transition: role for beta-catenin. The American journal of pathology *165*, 1955-1967.
19. Morishima, Y., Nomura, A., Uchida, Y., Noguchi, Y., Sakamoto, T., Ishii, Y., Goto, Y., Masuyama, K., Zhang, M.J., Hirano, K.*, et al.* (2001). Triggering the induction of myofibroblast and fibrogenesis by airway epithelial shedding. American journal of respiratory cell and molecular biology *24*, 1-11.
20. Nightingale, J., Patel, S., Suzuki, N., Buxton, R., Takagi, K.I., Suzuki, J., Sumi, Y., Imaizumi, A., Mason, R.M., and Zhang, Z. (2004). Oncostatin M, a cytokine released by activated mononuclear cells, induces epithelial cell-myofibroblast transdifferentiation via Jak/Stat pathway activation. Journal of the American Society of Nephrology : JASN *15*, 21-32.
21. O'Connor, J.W., and Gomez, E.W. (2013). Cell adhesion and shape regulate TGF-beta1-induced epithelial-myofibroblast transition via MRTF-A signaling. PloS one *8*, e83188.
22. O'Connor, J.W., Riley, P.N., Nalluri, S.M., Ashar, P.K., and Gomez, E.W. (2015). Matrix Rigidity Mediates TGFbeta1-Induced Epithelial-Myofibroblast Transition by Controlling Cytoskeletal Organization and MRTF-A Localization. Journal of cellular physiology *230*, 1829-1839.
23. Oldfield, M.D., Bach, L.A., Forbes, J.M., Nikolic-Paterson, D., McRobert, A., Thallas, V., Atkins, R.C., Osicka, T., Jerums, G., and Cooper, M.E. (2001). Advanced glycation end products cause

epithelial-myofibroblast transdifferentiation via the receptor for advanced glycation end products (RAGE). The Journal of clinical investigation *108*, 1853-1863.

24. Sebe, A., Leivonen, S.K., Fintha, A., Masszi, A., Rosivall, L., Kahari, V.M., and Mucsi, I. (2008). Transforming growth factor-beta-induced alpha-smooth muscle cell actin expression in renal proximal tubular cells is regulated by p38beta mitogen-activated protein kinase, extracellular signal-regulated protein kinase1,2 and the Smad signalling during epithelial-myofibroblast transdifferentiation. Nephrology, dialysis, transplantation : official publication of the European Dialysis and Transplant Association - European Renal Association *23*, 1537-1545.
25. Shukla, M.N., Rose, J.L., Ray, R., Lathrop, K.L., Ray, A., and Ray, P. (2009). Hepatocyte growth factor inhibits epithelial to myofibroblast transition in lung cells via Smad7. American journal of respiratory cell and molecular biology *40*, 643-653.
26. Sommer, M., Gerth, J., Stein, G., and Wolf, G. (2005). Transdifferentiation of endothelial and renal tubular epithelial cells into myofibroblast-like cells under in vitro conditions: a morphological analysis. Cells, tissues, organs *180*, 204-214.
27. Sun, Q., Sattayakhom, A., Backs, J., Stremmel, W., and Chamulitrat, W. (2012). Role of myocyte enhancing factor 2B in epithelial myofibroblast transition of human gingival keratinocytes. Experimental biology and medicine (Maywood, NJ) *237*, 178-185.
28. Thakur, S., Viswanadhapalli, S., Kopp, J.B., Shi, Q., Barnes, J.L., Block, K., Gorin, Y., and Abboud, H.E. (2015). Activation of AMP-activated protein kinase prevents TGF-beta1-induced epithelial-mesenchymal transition and myofibroblast activation. The American journal of pathology *185*, 2168-2180.
29. Xiao, X., Huang, C., Zhao, C., Gou, X., Senavirathna, L.K., Hinsdale, M., Lloyd, P., and Liu, L. (2015). Regulation of myofibroblast differentiation by miR-424 during epithelial-to-mesenchymal transition. Archives of biochemistry and biophysics *566*, 49-57.
30. Xie, X.S., Yang, M., Liu, H.C., Zuo, C., Li, H.J., and Fan, J.M. (2009). Ginsenoside Rg1, a major active component isolated from Panax notoginseng, restrains tubular epithelial to myofibroblast transition in vitro. Journal of ethnopharmacology *122*, 35-41.
31. Yang, J., and Liu, Y. (2001). Dissection of key events in tubular epithelial to myofibroblast transition and its implications in renal interstitial fibrosis. The American journal of pathology *159*, 1465-1475.
32. Yang, J., and Liu, Y. (2002). Blockage of tubular epithelial to myofibroblast transition by hepatocyte growth factor prevents renal interstitial fibrosis. Journal of the American Society of Nephrology : JASN *13*, 96-107.
33. Zhang, C., Meng, X., Zhu, Z., Liu, J., and Deng, A. (2004a). Connective tissue growth factor regulates the key events in tubular epithelial to myofibroblast transition in vitro. Cell biology international *28*, 863-873.
34. Zhang, C., Meng, X., Zhu, Z., Yang, X., and Deng, A. (2004b). Role of connective tissue growth factor in renal tubular epithelial-myofibroblast transdifferentiation and extracellular matrix accumulation in vitro. Life Sci *75*, 367-379.
35. Zhang, Y., Ma, X., Xie, X., Sun, G., Liang, W., Li, X., Wang, F., Zhang, L., Yan, B., and Fan, J. (2015). Role of P311 in interleukin-1alpha-induced epithelial to myofibroblast transition in kidney tubular epithelial cells. Renal failure *37*, 1384-1389.
36. Zhou, P., Lu, Y., and Sun, X.H. (2011). Zebularine suppresses TGF-beta-induced lens epithelial cell-myofibroblast transdifferentiation by inhibiting MeCP2. Molecular vision *17*, 2717-2723.