Editorial
Combating Kidney Fibrosis

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An estimated 10% of the world population has some form of kidney disease. Kidney fibrosis is the final common pathway of progressive kidney diseases, resulting in subsequent massive destruction of normal kidney structure and diminishing the function. Currently approved therapies are neither pathway nor cell specific in nature, due to which these therapies became ineffective in reducing the fibrosis and are associated with side effects. The understanding of the pathways and cells that are involved in the fibrosis will guide the future therapies to combat the kidney fibrosis.

In this special issue of the BioMed Research International, we have designed to invite original as well as review articles regarding the pathophysiologic clue to combat kidney fibrosis in various diseases.

In a research article Takako Nagai et al. (Kanazawa Medical University, Japan) focused on the endogenous antifibrotic peptide, N-acetyl-seryl-aspartyl-lysyl-proline (AcSDKP), one of the substrates of angiotensin converting enzyme (ACE), and found that AcSDKP suppressed kidney fibrosis in diabetes or even restored normal kidney structure from damaged kidney associated with the inhibition of endothelial mesenchymal transition and the induction of fibroblast growth factor receptor-microRNA let-7 axis.

There are two other research articles in the topic of diabetic nephropathy from the research team led by Yong Xu (Luzhou Medical College, China). Huang et al. found that proteasome inhibitor MG132 inhibited profibrotic cytokine transforming growth factor (TGF)-β signaling via endonuclear transcription corepressor SnoN degradation and ameliorated diabetic nephropathy. Another paper from Yong’s research team by Zhou et al. found that high glucose in mesangial cells induced sumoylation (by SUMO 2/3) of smad4, the co-smad essential for TGF-β-induced signal transduction, and such sumoylation would be important for enhanced TGF-β signal transduction in the cells exposed to high glucose condition and diabetic kidney.

Focusing on TGF-β-induced profibrotic signaling pathway on the ligand-receptor complex level, there are two exciting papers included in the special issue. Maeshima et al. (Gunma University Graduate School of Medicine, Japan) found that activin A, a member of TGF-β superfamily, exhibited profibrotic action in unilateral ureteral obstruction (UUO) model. They showed that UUO kidney displayed significant induction of activin A in the interstitial αSMA-positive fibroblasts and follistatin, an activin antagonist, significantly reduced the fibrotic area in the UUO kidney, suggesting the essential role of activin A signaling in the development of interstitial fibrosis in this model, and its antagonist could be a novel approach for the prevention of kidney fibrosis.

Another paper by Rodrigues-Diez et al. (Universidad Autonoma Madrid, Spain) focused on gremlin, a well-known bone morphogenetic proteins (BMPs) antagonist. They found that gremlin induced early activation of smad2/3 signal transduction via TGF-β independent manner in human tubular epithelial cells and long-term exposure of gremlin induced epithelial mesenchymal transition (EMT). Such long-term exposure of gremlin-induced EMT was diminished by TGF-β neutralizing antibody, suggesting that, different from early
Kidney fibrosis is important research topic for both clinicians and research scientists. Today we have neither magic drugs nor miracle method to cure kidney fibrosis. Despite such limitation in real world, as shown in this special issue, recent advance in the kidney fibrosis research would provide some clues for combating kidney fibrosis. We hope this special issue provides sufficient and useful information for clinical/basic science researchers to design the therapeutic approach and the future research directions.

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