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Mitochondrial Dynamics in Kidney Health and Disease

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Mitochondria is a key intracellular organelle in metabolically active organs such as brain,heart, kidney and muscle. Renal tubule cells are rich in mitochondria, especially high in the S1 segment . These renal tubule cells require this large amount of mitochondria due to their high-energy demand for reabsorption and secretion against chemical gradients, which heavily rely on normal mitochondrial oxidative phosphorylation to supply ATP as an energy source.[1]. Thus, last decade accumulating evidence shows mitochondrial dysfunctions in kidney have been tightly associated with many different renal papthologies including diabetic nephropathy, acute and chronic kidney disease. Recently, many mitochondria-targeting therapeutics have been demonstrated as effective interventions to preserve or improve functions in several animal models of renal injuries. In this presentation, we want to show the new basic mechanism between mitochondrial dynamics and kidney injury.

Reference)

1.. Hall AM, Unwin RJ, Parker N, Duchen MR. Multiphoton imaging reveals differences in mitochondrial function between nephron segments. J Am Soc Nephrol. 2009;20(6):1293– 302.