

Kidneys make sense

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Studying the physiology of the kidney makes a lot of sense because they are vital, uniquely interesting, awfully complicated and full of undiscovered territory. I will take you along a trail of discoveries that has outlined an auto- and paracrine signaling system, which is necessary to support proper renal function. This particular signaling system uses extracellular ATP, which can be released from renal epithelia to then stimulate membrane receptors (purinergic P2X and P2Y). Stimulation of these receptors has pronounced effects on the ability of renal epithelial cells to transport ions and water along the entire renal tubular system. In fact, intra-renal purinergic signals work as an endogenous “diuretic”, i.e. they favor the excretion of water and ions in the urine. I will also present data that outline the tubular lumen, i.e. the urinary space as an active signaling compartment important for renal function. Eventually, I will discuss how cellular ATP release occurs immediately downstream from sensory events, such as detection of an increase of urinary flow.