

Bladder cells feel stretch

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Japanese research group led by Prof. Makoto Tominaga and Dr. Takaaki Sokabe (National Institute for Physiological Sciences: NIPS), and Prof. Masayuki Takeda, Dr. Isao Araki and Dr. Tsutomu Mochizuki (Yamanashi Univ.), found that bladder urothelial cells have a sensor for stretch stimulation. Their finding was reported in the *Journal of Biological Chemistry* published on Aug 7, 2009.

Bladder is known to release ATP that activates micturition reflex pathway during urine storage. However, it has been unknown how urothelial cells sense bladder distension. The research group examined the function of 'TRPV4' protein abundantly expressed in urothelial cells. The group developed a special apparatus to measure cell responses upon stretch stimulation, which mimics bladder distension.

Upon stretch stimulation, robust Ca²⁺ influx and following ATP release were observed in urothelial cells. These phenomena were almost completely attributed to TRPV4 activation, since such responses were eliminated by a TRPV4 inhibitor and reduced in TRPV4-deficient urothelial cells.

Dr. Sokabe said, "This is the first report to show that TRPV4 is a primal stretch-detector in urothelial cells. Given that TRPV4 is critically involved in the sensing mechanism in the bladder, development of chemicals modulating TRPV4 activity may be useful for treatment of bladder disorders such as overactive [bladder](#) and pollakiuria."

Source: National Institute for Physiological Sciences

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