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**Biomedical Research**

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[\[PDF \(786K\)\]](#) [\[References\]](#)**Bladder volume-dependent excitatory and inhibitory influence of lumbosacral dorsal and ventral roots on bladder activity in rats**Kimio SUGAYA<sup>1)</sup> and William C. de GROAT<sup>2)</sup>

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**ABSTRACT**

This study was undertaken to examine the role of the afferent and efferent pathways of the lumbosacral spinal nerve roots in the tonic control of bladder activity. Changes of isovolumetric bladder activity were recorded in 21 sympathectomized female rats under urethane anesthesia following transection of the dorsal (DRT) and ventral (VRT) lumbosacral spinal roots, and after intraperitoneal administration of hexamethonium. DRT altered the baseline intravesical pressure in a bladder volume-dependent manner in each animal. The percent change of baseline pressure after VRT following DRT was also dependent upon bladder volume. The percent change of baseline pressure after VRT alone was similarly dependent on bladder volume, but not after VRT followed by DRT. The percent change of baseline intravesical pressure (y)(-9 to +8 cm H<sub>2</sub>O, -56 to +46%) after DRT and VRT depended upon bladder volume (x)(y = 44.7 x -40.4) in all rats. Hexamethonium increased the amplitude of small myogenic bladder contractions after DRT and VRT. In conclusion, the bladder is tonically excited or inhibited by a local reflex pathway and by a parasympathetic reflex pathway that depends on connections with the lumbosacral spinal cord and the pelvic nerves. Both reflex mechanisms are influenced by bladder volume.

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