



Isovolumetric bladder model

A MODEL FOR BLADDER HYPERACTIVITY / OVERACTIVE BLADDER

Model

Spontaneous rhythmic bladder contractions under isovolumetric condition in female anesthetized animals.
Filling of the bladder after acute urethral ligation activates pelvic afferent fibers which induces continuous rhythmic bladder contractions.

Species

- Rat
- Guinea-pig

Interest

- This model is suitable for testing compounds for effects on the bladder reflex and is often used as a relatively high throughput in vivo model for screening compounds.
- Compounds producing effects in this model include those acting on afferent C-fibers such as TRPV1 and TRPM8 receptor antagonists, NK₁ antagonists and purinergic P2X3 receptor antagonists, but also compounds acting on efferent nerves such as muscarinic antagonists.

Model Description

- The ureters are ligated and transected. The bladder is initially emptied, the urethra ligated then the bladder is slowly filled with saline until rhythmic bladder contractions (RBC) are induced.
- Test compounds can be administered intravenously (other routes may be possible depending on compound characteristics) and cystometric parameters evaluated for up to one hour post-administration.

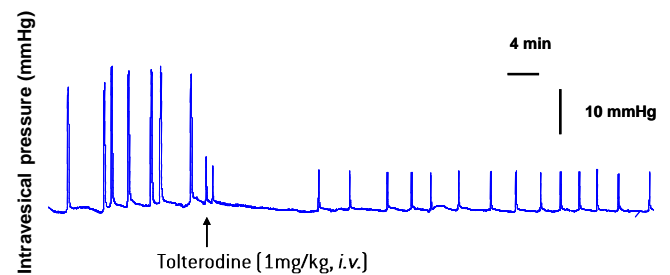
Parameters evaluated

- Frequency of bladder contractions
- Amplitude of bladder contractions
- Threshold volume

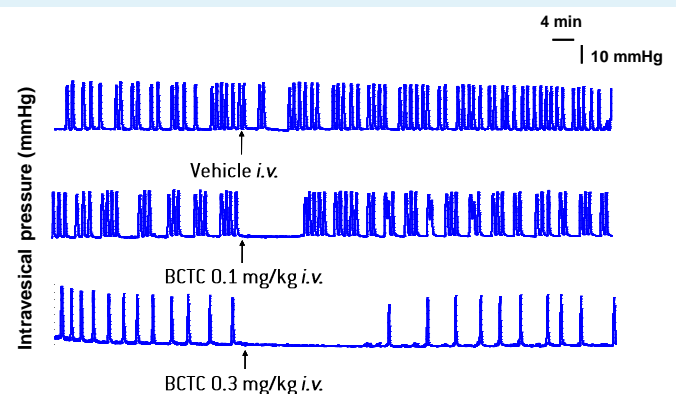
Scientific publications

- Lluell P *et al*, Aspet-Ray Fuller Symposium, Lower Urinary Tract Disorders, July 6-7, 2002
- Yoshiyama M & de Groat WC, Am. J. Physiol. 280: R1414-R1419, 2001
- Shimizu I *et al*, Eur. J. Pharmacol. 412: 171-179, 2001
- Uchida M *et al*, J. Pharmacol. Sci. 94: 122-128, 2004

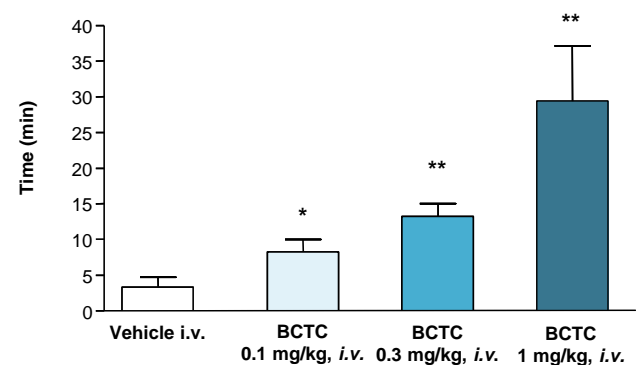
Effect of tolterodine, a muscarinic antagonist, on the amplitude of rhythmic bladder contractions



Effect of BCTC, a TRPV1 and TRPM8 receptor antagonist, on the frequency of rhythmic bladder contractions



Effects of vehicle and BCTC on time to the first contraction after administration in anesthetized female rats



*P=0.051, **P<0.01 (n=6 per group)