

## 414 Abstracts

alterations in levels of various growth factors. These changes may result from repetitive mechanical stresses on bladder smooth muscle cells in response to outlet obstruction. Our results indicate that increases in both passive and active force of bladder smooth muscle stimulate HB-EGF gene expression and thus play a role in the development of bladder hypertrophy. The reduction in HB-EGF mRNA in the presence of losartan suggests that HB-EGF gene expression is mediated in part by autocrine AngII. These findings may support a potential pharmacologic role for losartan in preventing or reversing bladder smooth muscle hypertrophy.

1. Am J Physiol. C1247-C1254, 1998.
2. J Clin Invest. 99:1028-1036, 1999.
3. Cell. 75:977-984, 1993.
4. J Clin Invest. 92:3003-3007, 1993.

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Title (type in CAPITAL LETTERS, leave one blank line before the text):

### OPTIMIZATION OF SACRAL ANTERIOR ROOT STIMULATION (SARS) BY THE APPLICATION OF MULTICHANNEL-GENERATED, QUASITRAPEZOIDAL PULSES IN AN ANODAL BLOCK TECHNIQUE IN A CANINE MODEL

**AIMS OF STUDY** After spinal cord injury with loss of bladder function, reservoir function and voiding control can be restored by sacral anterior root stimulation (SARS) with deafferentation. Previous studies with modified, size-adapted Finetech Brindley electrodes revealed very good results in selective sphincter blockade and simultaneous bladder stimulation using modified quasitrapezoidal (QT) pulses in an anodal block technique. The aim of this study was to apply four QT-pulses, determined in previous trials, by means of a multichannel bladder stimulator.

**METHODS** In acute animal trials, lumbar laminectomy (L4-L7) and sacral deafferentation (S1-S4) were performed in 6 male anaesthetized foxhounds. The sacral anterior root S2 was placed into a modified tripolar Brindley electrode. Two mono- and two biphasic quasitrapezoidal (QT) pulses were applied in uni- and bilateral trials. Sphincter pressure was urodynamically monitored. Current parameters that demonstrated the best sphincter pressure reduction in unilateral application were utilized for multichannel stimulation. Bilateral measurements were analyzed, evaluated and compared with the multichannel sphincter pressure results. A two-channel current source (Fraunhofer Institute, IMBT) with two direct arbitrary programmable signal channels initiated stimulation. Each anterior root was stimulated separately.

**RESULTS** A selective urethral sphincter blockade was achieved in all QT series. In bilateral stimulation trials the average sphincter pressure could be reduced to 8.05 % of its maximum value. In multichannel stimulation sphincter pressure reduction to 4.78 % was seen. For maximal sphincter blockade the average current applied (1.1 to 1.2 mA) was the same with multichannel stimulation and with bilateral stimulation.

**CONCLUSIONS** It is possible to achieve selective urethral sphincter relaxation with the application of quasitrapezoidal pulses in an anodal block stimulation technique. The application of individually specified current parameters to each sacral nerves enables better sphincter blockade than bilateral stimulation using the same parameters for each side with the application of the same amount of current. Multichannel stimulation is essential in the development of a neurostimulator that will induce coordinated and synergic bladder contractions. In the near future it will be possible to adjust the signal and current in this stimulator for simultaneous parameter application in accordance with bladder filling.

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Title (type in CAPITAL LETTERS, leave one blank line before the text):

### INFLUENCE OF INTRAVESICAL LOW PH ON THE MICTURITION REFLEX THRESHOLD IN THE RAT