



# Involvement of mast cells in the increase of intestinal muscle contractility in post-Nippostrongylus brasiliensis-infected rats

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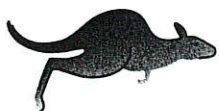
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# 16th INTERNATIONAL SYMPOSIUM ON GASTROINTESTINAL MOTILITY

LORNE VICTORIA  
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## Abstract form

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### INVOLVEMENT OF MAST CELLS IN THE INCREASE OF INTESTINAL MUSCLE CONTRACTILITY IN POST-*NIPPOSTRONGYLUS* *BRASILIIENSIS*-INFECTED RATS.

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It has been reported that patients with Irritable Bowel Syndrome (IBS) may have developed their condition following an episode of enteric infection (Gwee et al. *Lancet*, 347, 1996). In addition, IBS has been suggested to involve both an increase of mast cell numbers in the human gut (Weston et al. *Dig Dis Sci*, 38, 1993) and an altered intestinal motor function. This study investigated whether the long-term hypermastocytosis which occurs in the rat gut following an infection with the nematode *Nippostrongylus brasiliensis* (Nb), affects intestinal smooth muscle contractility responses to cholinergic stimulation.

**Methods:** Male Wistar rats (200-250 g) were infected with 3000 Nb L3 larvae (s.c.) and sacrificed 30 days later; non-infected littermates served as controls. Full thickness pieces of jejunum were collected. Histological analyses (hemalun eosin to reveal structural features and alcian blue for mast cell staining), enzyme myeloperoxidase (MPO) activity assays, and in vitro contractility studies were performed. Isometric muscle tension responses to carbachol (0.1 nM to 10  $\mu$ M) were recorded and quantified, before and after application of the mast cell degranulator compound 48/80 (2 mg/ml). The potency of carbachol was expressed as EC<sub>50</sub> in nM (Mean and 95% confidence limits; n=6) and maximal contractile effect (E<sub>max</sub>) expressed in % of that induced by 60 mM KCl (Mean $\pm$ SEM; n=6).

**Results:** At 30 days post-infection, MPO activity assays and histology studies revealed the absence of inflammation in the jejunum. In contrast mucosal mast cell numbers were increased to 342 $\pm$ 124 per mm<sup>2</sup> of tissue in infected rats vs 67 $\pm$ 28 in non-infected controls. Carbachol induced concentration-related muscle responses in both infected and non-infected rats with similar E<sub>max</sub> (181.7 $\pm$ 6.1% and 163.6 $\pm$ 9.8%, respectively), whereas EC<sub>50</sub>s were significantly lower in infected rats than in non-infected controls (32.7 [19-55.8] and 119.8 [58-244] nM;  $p < 0.05$ ). Pre-treatment of jejunum strips with compound 48/80, decreased carbachol-induced E<sub>max</sub> contraction in strips from infected rats (117.2 $\pm$ 10.2% vs. 181.7 $\pm$ 6.1%;  $p < 0.05$ ) but not in those from non-infected rats (134.0 $\pm$ 12.0% vs. 163.6 $\pm$ 9.8%;  $p > 0.05$ ) whereas EC<sub>50</sub>s were not different in both 48/80-treated groups (117 [38.5-360] and 150 [86-282] nM, respectively).

**Conclusion:** This study suggests that the hypermastocytosis that occurs in the jejunum of post Nb-infected rats cause increased intestinal muscle responsiveness to cholinergic agents which overall may result in altered intestinal contractility.

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