

# **Action of myenteric GABAergic neurons in guinea pig stomach**

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摘要

## **Abstract**

GABAergic neurons in the guinea pig stomach were localized immunocytochemically using antibodies against its synthesizing enzyme, l-glutamate decarboxylase (GAD). Numerous ganglion cells and nerve bundles in the myenteric plexus were found to be GAD-positive, while the longitudinal muscle, submucosa and mucosa were largely devoid of GABAergic innervation. The distribution of GABAergic neurons and their processes in both myenteric ganglia and circular muscle is rather uneven throughout the stomach. GABA elicited contraction of the longitudinal fashion (LF) strips of the body and antrum of guinea pig stomach in a concentration-dependent fashion with a maximal response at  $10^{-7}$  M and  $10^{-5}$  M, respectively. GABA-induced contraction appears to be mediated by the GABAA receptor and not the GABAB receptor, since the action is blocked by bicuculline, a GABAA receptor antagonist. Furthermore, GABAA agonists e.g. muscimol produced even stronger responses than GABA itself while GABAB agonist, (-)baclofen had no effect in eliciting muscle contraction. The GABAA receptor is desensitized by prolonged exposure to its agonists such as GABA and muscimol. However, no such desensitization was observed for the muscarinic cholinergic receptor. The GABA action in eliciting smooth muscle contraction seems to involve two components, one is scopolamine and tetrodotoxin (TTX) sensitive, and the other one is insensitive to scopolamine and TTX. It is proposed that the scopolamine- and TTX-sensitive component acts through a direct or indirect interaction between GABAergic and cholinergic neurons whereas the scopolamine- and TTX-insensitive component acts directly upon the smooth muscle.