



Title	ANALYSIS OF THE REFLEX POTENTIAL IN THE VAGUS NERVE
Author(s)	NAKAZATO, Yoshikazu
Citation	Japanese Journal of Veterinary Research, 15(2), 100-101
Issue Date	1967-06
Doc URL	<a href="http://hdl.handle.net/2115/1872">http://hdl.handle.net/2115/1872</a>
Type	bulletin (article)
File Information	KJ00002369293.pdf



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the left ventricular epicardial surface at different times.

These results may show the fact that the subendocardial musculature of the left ventricle is activated uniformly, but that the subepicardial musculature is activated not uniformly, but irregularly, and electromotive forces of the subendocardial musculature are much stronger than those of the subepicardial musculature, and vice versa.

Also, in unipolar precordial lead electrocardiograms, the deflection at the onset of QRS may be derived from the activation of the interventricular septum, at midterm from the activation of almost all areas of the ventricles, except the basilar area, and at the termination of QRS from the activation of the basilar area of the ventricle.

## ANALYSIS OF THE REFLEX POTENTIAL IN THE VAGUS NERVE\*

Yoshikazu NAKAZATO

*Department of Pharmacology  
Faculty of Veterinary Medicine  
Hokkaido University, Sapporo, Japan*

To elucidate physiological as well as pharmacological properties of the reflex potentials of the vagus nerve in response to the afferent stimulation of the vagus, great splanchnic or sciatic nerve, these experiments were undertaken in cats under chloralose anesthesia.

1) The reflex potentials of the cervical vagus nerve were related to the reflex activation of both somatic and autonomic nerve fibers in the vagus nerve. In the thoracic and abdominal vagus nerve, however, the reflex potentials were due to activation of the autonomic fibers. The reflex potentials of the recurrent nerve, on the other hand, were presented by activation of the somatic fibers.

The activation of autonomic fibers was mainly elicited by vagal stimulation and the somatic fibers were activated by the stimulation of the vagus, great splanchnic or sciatic nerve.

2) In view of the results obtained by the transection or sagittal section of the brain stem, it was confirmed that the afferent volleys of the vagus nerve were relayed to the contralateral vagus nerve via the midline region, which was delimited between ca. 1 mm rostral to and 3 mm caudal to the obex in the

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\* A part of these works appeared in "Jap. J. Pharmacol." **16**, 117, 1966 and another part will be published in "J. physiol. Soc. Japan" (in Japanese with English summary) in near future.

medulla oblongata. The reflex potentials due to activation of the autonomic fibers, which proceed in the abdominal vagus nerve, were abolished by a sagittal section in the midline to a depth of 1.5 mm from the dorsal surface in this area.

3) The reflex potentials due to the stimulation of the sciatic nerve were augmented by strychnine (100  $\mu$ g/kg i. v.) and reduced by mephenesin (50 mg/kg i. v.). After intravenous administration of pentobarbital (15 mg/kg), the reflex potentials evoked by the stimulation of the vagus, great splanchnic or sciatic nerve were reduced or abolished. By injection of GABA (200 mg/kg i. v.) the potentials related to the activation of autonomic fibers in the abdominal vagus nerve were depressed, while other potentials were not affected. No consistent effects were observed by hexamethonium (15 mg/kg i. v.) administration.

Hokkaido University granted the degree of Doctor of Veterinary Medicine to the following graduate of the Post-Graduate School on March 25, 1967. The author's summary of his thesis is as follows :

## **FORMAL PATHOGENESIS OF HAEMATURIA VESICALIS BOVIS**

### **— NEUROPATHOLOGICAL INVESTIGATION —**

Takashi YOSHIKAWA

*Department of Comparative Pathology  
Faculty of Veterinary Medicine  
Hokkaido University, Sapporo, Japan*

(Summary of Doctors thesis written under direction of Dr. Y. FUJIMOTO)

Nine naturally occurring cases (Holstein-Friesian cows, 3~12 years of age) of haematuria vesicalis bovis were investigated histopathologically from the general viewpoints and with special consideration of neuropathology.

1) It may be considered that true pathological character of the present disease is a systemic polyneuropathy in which organic changes in the autonomic nerves innervating the urinary bladder (disturbances of the autonomic nerves) are especially noticeable. The lesions in the nerves were usually old, and their quantitative severity had almost nothing to do with the extent of neoplastic growths in the urinary bladder, anaemia, cachexia or other disorders.

It may be possible that haematuria vesicalis bovis is not only disease of the urinary bladder, but also a systemic disease.

2) The common findings in the urinary bladder were as follows: Various