



HOKKAIDO UNIVERSITY

Title	ROLE OF Na ⁺ -K ⁺ PUMP ACTIVITY IN PANCREATIC SECRETION IN THE HYPERTROPHIED PANCREAS OF THE RAT
Author(s)	ISHIKAWA, Toru
Citation	Japanese Journal of Veterinary Research, 34(2), 134-134
Issue Date	1986-04-30
Doc URL	https://hdl.handle.net/2115/2981
Type	departmental bulletin paper
File Information	KJ00002374388.pdf



ROLE OF $\text{Na}^+ - \text{K}^+$ PUMP ACTIVITY IN PANCREATIC SECRETION IN THE
HYPERTROPHIED PANCREAS OF THE RAT

Toru ISHIKAWA

*Department of Physiology
Faculty of Veterinary Medicine
Hokkaido University, Sapporo 060, Japan*

1. A synthetic protease inhibitor (FOY-305) was administered orally once a day for 21 days. This procedure caused significant hypertrophy of rat pancreas. The role of the $\text{Na}^+ - \text{K}^+$ pump in pancreatic secretion was examined in an isolated perfused preparation of the hypertrophied pancreas.
2. Basal level of fluid secretion in the preparation of hypertrophied pancreas was about ten times as high as that in the preparation of normal pancreas. The basal levels were reduced lowering Na^+ or K^+ concentration and by adding 1mM ouabain to the solution perfusing the hypertrophied pancreas.
3. Maximum fluid secretion was evoked by stimulation with 100 pM CCK-8, whereas maximum protein output was induced by stimulation with 300 pM in the preparation of hypertrophied pancreas.
4. Both fluid secretion and protein output induced by 100 pM CCK-8 were reduced by lowering Na^+ or K^+ concentration and by adding 1 mM ouabain to the solution perfusing the hypertrophied pancreas.
5. When the hypertrophied pancreas was perfused with a solution containing 2.8mM K^+ or 1mM ouabain, parallelism between fluid secretion and protein output induced by 100 pM CCK-8 was lost.
6. Based on these results, the following conclusions were made.
 - (1) $\text{Na}^+ - \text{K}^+$ pump activity plays an important role in maintaining the basal level of fluid secretion in the perfused preparation of hypertrophied pancreas.
 - (2) $\text{Na}^+ - \text{K}^+$ pump activity may be strongly enhanced and play cardinal roles in the increase of both fluid secretion and protein output induced by CCK-8 in the perfused preparation of hypertrophied pancreas.
 - (3) The mechanism of fluid secretion may differ from that of protein output.