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THE ROLE OF $\text{Na}^+ - \text{K}^+$ ATPase ON SECRETORY AND REDOX RESPONSE
IN THE ISOLATED PERFUSED RAT PANCREAS

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1. The role of $\text{Na}^+ - \text{K}^+$ pump ($\text{Na}^+ - \text{K}^+$ ATPase) on stimulus-secretion coupling in the pancreatic acinar cell was studied by estimating the effects of ouabain and low K^+ environment on both secretory and redox responses to continuous stimulation with CCK-8 in the isolated perfused rat pancreas.
2. The secretory response (protein output) induced by CCK-8 was completely abolished in the presence of 1 mM ouabain, whereas the cytochrome reduction induced by CCK-8 was not affected by 1 mM ouabain.
3. The secretory response to CCK-8 was also abolished by removing K^+ from the perfusing and bathing solution, and the redox response induced by CCK-8 was inhibited by K^+ removal. This inhibitory effect of K^+ removal on the redox response was similar to that of Ca^{2+} removal.
4. Tissue [ATP]/[ADP] ratio was significantly increased after 20 minutes' continuous stimulation with CCK-8. Neither addition of ouabain nor K^+ removal increased the tissue [ATP]/[ADP] ratio.
5. Based on these results, it was concluded that (1) $\text{Na}^+ - \text{K}^+$ pump may play a significant role in stimulus-secretion coupling in the pancreatic acinar cell, and (2) CCK-induced cytochrome reduction may be closely correlated with $\text{Na}^+ - \text{K}^+$ ATPase activity, but may not be a direct indication of the activation of $\text{Na}^+ - \text{K}^+$ ATPase.
6. It is supposed that the pancreatic secretagogues act on the acinar cells to increase cytosolic free Ca^{2+} concentration, and the increase in cytosolic free Ca^{2+} concentration, in turn, accelerates frequency of exocytosis of zymogen granules and activates energy production in mitochondria.