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SECRETORY RESPONSE TO SECRETIN  
IN RAT PERFUSED PANCREAS

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1. Influence of extracellular  $\text{Ca}^{2+}$  on secretin-induced secretory responses (enzyme output and juice flow) was examined in the isolated perfused rat pancreas.
2. Secretin in the range of 100pM to 10nM produced dose-dependent secretory responses.
3. The secretin-induced enzyme output was markedly inhibited when  $\text{CaCl}_2$  was removed from the perfusing solution, whereas the fluid secretion induced by higher doses of secretin (1.0 and 10nM) was inhibited insignificantly.
4. Not only the enzyme output but also the fluid secretion induced by 1  $\mu\text{M}$  forskolin were inhibited in  $\text{Ca}^{2+}$ -deficient environment.
5. Continuous stimulation with 100  $\mu\text{M}$  dbcAMP caused gradual increases in the pancreatic secretory responses. The enzyme output response was abolished but the fluid secretion was slightly inhibited in  $\text{Ca}^{2+}$ -deficient environment.
6. Continuous stimulation with 1nM secretin induced a gradual increase in the amount of intracellular cyclic AMP, which was significantly decreased in  $\text{Ca}^{2+}$ -deficient environment.
7. The present results show that pancreatic enzyme output induced by secretin depends on the extracellular  $\text{Ca}^{2+}$  concentration. In this case the activity of adenylate cyclase, the enzyme of cyclic AMP synthesis, may be inhibited in the  $\text{Ca}^{2+}$ -deficient environment.

Two possible mechanisms involved in the  $\text{Ca}^{2+}$  dependent enzyme output were discussed in relation to the two kinds of intracellular second messengers,  $\text{Ca}^{2+}$  and cyclic AMP.