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DIFFERENCE OF Ca^{2+} and Na^+ DEPENDENCY AMONG SECRETORY
RESPONSES TO VARIOUS CCK_8 CONCENTRATIONS IN RAT EXOCRINE
PANCREAS.

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The roles of extracellular Na^+ ($[\text{Na}^+]_o$) and Ca^{2+} ($[\text{Ca}^{2+}]_o$) were examined in pancreatic responses (protein output and juice flow) induced by CCK_8 at physiological (5 pM), maximal (50 pM) and a supramaximal (1 nM) concentrations in the isolated perfused rat pancreas.

The pancreatic responses induced by 5 pM CCK_8 were completely abolished by removing either $[\text{Na}^+]_o$ or $[\text{Ca}^{2+}]_o$. The pancreatic responses induced by 50 pM CCK_8 were decreased, but still remained by removing either $[\text{Na}^+]_o$ or $[\text{Ca}^{2+}]_o$. The pancreatic responses induced by 1 nM CCK_8 were smaller than those induced by 50 pM CCK_8 . The responses were not completely abolished by removing $[\text{Ca}^{2+}]_o$, and were not affected by removing $[\text{Na}^+]_o$. The responses, however, were completely abolished by removing both $[\text{Na}^+]_o$ and $[\text{Ca}^{2+}]_o$.

Based on these and other results, the following conclusions were made:

(1) The pancreatic secretory responses induced by CCK_8 at the physiological concentration are initiated by $[\text{Na}^+]_o$ -dependent Ca^{2+} influx (e. g. Na^+ and Ca^{2+} cotransport).

(2) The pancreatic secretory responses induced by CCK_8 at the maximal concentration consist of two components: $[\text{Na}^+]_o$ -independent Ca^{2+} influx and $[\text{Na}^+]_o$ -dependent Ca^{2+} release from intracellular Ca stores.

(3) The pancreatic secretory responses induced by CCK_8 at the supramaximal concentration also contain the above two components. The response may coincide with $\text{Na}^+/\text{Ca}^{2+}$ countertransport, and diminution of the responses may be due to an extreme increase in $[\text{Ca}^{2+}]_i$.