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SECRETORY RESPONSES TO VARIOUS SECRETAGOGUES
AND CHANGES IN THE COMPONENTS OF DIGESTIVE ENZYMES
IN THE ISOLATED PERFUSED GUINEA PIG PANCREAS

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Changes in the ratios of three digestive enzymes (amylase, trypsinogen and chymotrypsinogen) in the pancreatic juice were examined before and during continuous stimulation with CCK-8, VIP and CCh in the isolated perfused pancreas of guinea pig.

The ratio of amylase to total protein and that of trypsinogen to total protein remained almost unchanged during the continuous stimulation with CCK-8, VIP and CCh. However, the ratio of chymotrypsinogen to total protein was markedly decreased during continuous stimulation with these secretagogues.

The ratios of amylase to trypsinogen (A/T) and chymotrypsinogen to trypsinogen (C/T) in pancreatic juice were reduced slightly when a higher concentration of CCK-8 was used. The C/T ratio estimated during stimulation with 1nM CCK-8 was significantly smaller than that obtained during stimulation with 30pM CCK-8. Conversely, the ratio of amylase to chymotrypsinogen (A/C) was increased slightly when a higher concentration of CCK-8 was used. The A/C ratio obtained during stimulation with 1nM CCK-8 was significantly larger than that obtained during stimulation with 30pM CCK-8.

During stimulation with 300pM VIP, the A/T ratio was similar to that obtained during stimulation with 30 pM CCK-8. However the C/T ratio was significantly larger, and the A/C ratio was significantly smaller than those estimated during stimulation with 30pM CCK-8.

The ratios of A/T and C/T estimated during stimulation with 1 μ M CCh were not significantly different from those obtained during stimulation with 300pM CCK-8. The A/C ratio obtained during stimulation with 1 μ M CCh was significantly smaller than that obtained during stimulation with 300pM CCK-8.

The ratio of A/T and A/C in pancreatic juice were significantly higher, and the C/T ratio in pancreatic juice was significantly lower than the corresponding ratio in pancreatic tissue.

The present results show that the enzyme composition of the pancreatic juice is not identical to that of the pancreatic tissue, and that the enzyme composition of the pancreatic juice can be altered by stimulation with different kinds of secretagogues and with the same secretagogue at different concentrations. These results are favorable to the view of "nonparallel secretion" of the pancreatic enzymes in the pancreatic acinar cell of the guinea pig.