THE STIMULATORY EFFECT OF *E. COLI* HEAT STABLE ENTEROTOXIN ON CHLORIDE SECRETION BY THE RECTAL GLAND OF *SQUALUS ACANTHIAS* IS NOT INHIBITED BY PROCAINE

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We have previously shown that guanylin and the heat stable enterotoxin of *escherichia coli* (Sta) stimulate the secretion of chloride by the isolated perfused rectal gland of the shark (Silva, P. et al. Bull. MDIBL 36: 53-54, 1997). Both guanylin and Sta bind to a guanylate cyclase-linked receptor. Atrial natriuretic peptide (ANP) also binds to guanylate cyclase-linked receptors and stimulates the secretion of chloride by the rectal gland. The stimulatory effect of ANP is mediated by vasoactive intestinal peptide (VIP) and can be blocked with procaine. To determine whether or not the effect of Sta is also mediated by VIP we examined its effect in glands perfused with procaine.

Shark rectal glands were perfused as described in Silva, P. et al. (Methods Enzymol. Vol 192:754-66, 1990). The glands were perfused with or without procaine, 10^{-2}M. The secretion of chloride was collected for consecutive 10 minute periods. There was an initial thirty minute control period (three collection periods) to allow the secretion of chloride to reach a stable rate. At the end of this control period, 2 x 10^{-7}M Sta, final concentration was added to the perfusate and collections continued for additional thirty minutes. In some experiments, the secretion of chloride was allowed to return to a basal rate and Sta was added again.

Procaine did not prevent the stimulatory effect of Sta. Figure 1 summarizes the results. Sta stimulated the secretion of chloride both in the presence and absence of procaine. We conclude from these experiments that the effect of Sta is not inhibited by procaine and therefore unlikely to be mediated by the release of VIP. These experiments also indicate that the effect of Sta is exerted directly on the rectal gland cells, probably on the basolateral border.

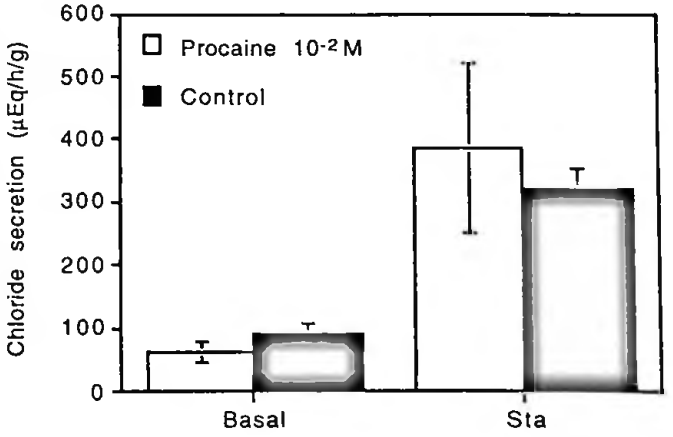

Figure 1. Sta significantly stimulated the secretion of chloride in both the control perfusions and also in those perfused with procaine ($p < 0.01$ for both sets of experiments). There was no significant difference in the rate of chloride secretion achieved with Sta between the glands perfused with procaine and those without it. Values are mean±SEM, n=6 for glands perfused with procaine and 13 for those perfused without procaine.

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