PEPTIDE HISTIDINE ISOLEUCINEAMIDE STIMULATES CHLORIDE SECRETION IN THE PERFUSED SHARK RECTAL GLAND

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Peptide Histidine Isoleucineamide (PHI) is an endogenous ligand that activates VIP receptors in numerous tissues. PHI and VIP share a common precursor peptide in mammals and as we have previously shown, in the dogfish shark. We previously reported the full length cloning and sequence of the PHI hormone gene from shark brain using degenerate PCR and RACE-PCR (Plesch et al, Bull. MDIBL 39: 135-136, 2000). In the present experiments, we examined whether mammalian (porcine) PHI activated chloride secretion in the isolated perfused rectal gland. Glands were perfused with shark Ringers for thirty minutes, then PHI was constantly infused at a concentration from 1 to 10 nM for the next thirty minutes with readings at 1 min intervals. At a concentration of 1 nM, PHI was without effect on chloride secretion. This contrasts with 1nM porcine VIP, which stimulated chloride secretion to approximately 1400 μEqCl/h/g in parallel control experiments (n=4). PHI (2.5nM) elicited a slight increase in chloride secretion above basal values. At concentrations of 5 and 10 nM chloride secretion increased to approximately 800 and 1200 μEqCl/h/g respectively.

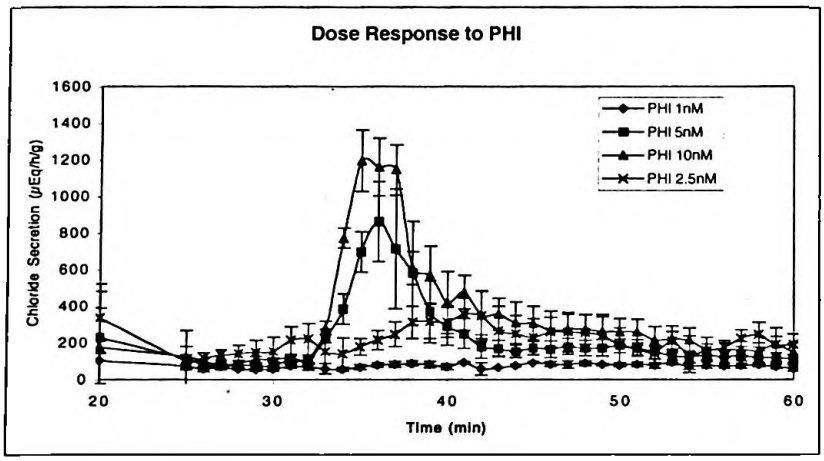

Figure 1. Dose response to porcine PHI (1-10 nM) stimulated chloride secretion in the perfused shark rectal gland (n=3-6 glands at each concentration).

These experiments demonstrate that in the *in vitro* perfused shark rectal gland, mammalian PHI is a chloride secretagogue, although the peptide is less potent than VIP or pituitary adenylate cyclase activating peptide (PACAP). We predict that the potency order of mammalian ligands for the cloned shark VIP receptor will be VIP=PACAP>PHI.

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