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Mechanisms of Gastric Mucus Secretion from Cultured Rat Gastric Epithelial Cells Induced by Carbachol, Cholecystokinin Octapeptide, Secretin, and Prostaglandin E₂

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The effects of carbachol, cholecystokinin octapeptide (CCK-8), secretin, prostaglandin E₂ (PGE₂), and second mediator-like substances (A23187, phorbol 12-myristate 13-acetate), and dibutyryl cAMP on mucus secretion from cultured gastric epithelial cells were investigated. Secreted mucus induced by any combination of receptor agonists was almost equal to the summation of each stimulated mucus secretion. On the other hand, combined stimulation with second mediator-like substances secreted mucus synergistically. These results suggest the existence of interactions among receptors for mucus secretion. Secretin and PGE₂ induced cAMP accumulation, and carbachol and CCK-8 induced a [Ca²⁺]_i increase. An intracellular calcium chelator inhibited the mucus secretion induced not only by carbachol and CCK-8 but also by secretin and PGE₂. These results suggest that the [Ca²⁺]_i plays an important role in mucus secretion through cAMP accumulation.