Involvement of phospholipase A_2 in ATP-induced mucin release from cultured Hamster Tracheal Surface Epithelial cells

Jo,M[0]., Ko,K.H. and Kim,K.C.[1]

College of Pharmacy,Seoul National University
School of Pharmacy,University of Maryland at Baltimore[1]

Mucin release from hamster tracheal surface epithelial(HTSE) cells can be stimulated by extracellular ATP via activation of P_2 purinoceptors located on the cell surface which appears to be coupled to phospholipase C via G proteins. However, our preliminary data indicate that the ATP-induced mucin release involves,in part,activation of PKC,but not an increase in the intracellular Ca++ level,suggesting the presence of another pathway which is separate from the PLC-PKC pathway. In this study,we intended to confirm the previous observation and subsequently identify an additional mechanism. Confluent HTSE cells were metabolically labeled with either ^{3}H-glucosamine or ^{3}H-arachidonic acid(AA),and release of either ^{3}H-mucin or ^{3}H-AA was quantified following various treatments. ^{3}H-mucin was assayed using the sepharose CL-4B gel-filtration method, whereas ^{3}H-AA liberation was measured by counting ^{3}H-radioactivity in the chase medium. We found that: (1)Desensitization of PKC by pretreatment with PMA completely abolished the mucin releasing effect of PMA but partially inhibited the ATP-induced mucin release; (2) ATP increases release of ^{3}H-AA in a dose-dependent fashion; (3) mepacrine,an inhibitor of PLA_2, attenuates ATP-induced mucin release in a dose-dependent fashion. These results confirm our previous notion that the PLC-PKC pathway is responsible, in part, for ATP-induced mucin release. Furthermore,activation of PLA_2 appears to be an additional pathway which is involved in ATP-induced mucin release.