Non-specific activation of human eosinophil functional responses by vasoactive intestinal peptide

http://www.firstlight.cn 2006-03-16

Eosinophils and neuropeptides are thought to play effector roles in allergic diseases, such as rhinitis; however, little is known about th e biological effects of neuromediators, especially vasoactive intestinal peptide (VIP), on eosinophil functional responses. In the present stud y, it is shown that VIP induces eosinophil chemotaxis and eosinophil-derived neurotoxin (EDN) release in potency comparable with that indu ced by platelet activator factor, and in a novel synergistic manner with recombinant human interleukin-5. Contrary to chemotaxis, EDN relea se was sensitive to staurosporine, the protein kinase C inhibitor, as well as intracellular calcium chelation. However, eosinophil treatment wit h inhibitors of tyrosine kinases (herbimycin A) and phosphatases (pervanadate) resulted in a dose-dependent potentiation and blockage of VI P-induced eosinophil chemotaxis, respectively. Treatment of eosinophils with VIP receptor antagonist did not modify VIP-induced chemotaxi s or EDN release. Furthermore, exploration of vasoactive intestinal peptide receptor I expression was lacking in human eosinophils, but not ly mphocytes. These results demonstrate two different mechanisms in triggering eosinophil activation of functional responses by VIP, a calciu m-dependent degranulation and a calcium-independent chemotaxis, and elaborate on a novel cytokineneuropeptide interaction in eosinophilic i nflammation.

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