PublisherInfo		
PublisherName	:	BioMed Central
PublisherLocation	:	London
PublisherImprintName	:	BioMed Central

IL-5 induces leukotriene receptor expression

ArticleInfo		
ArticleID	:	1635
ArticleDOI	:	10.1186/rr-2001-68567
ArticleCitationID	:	68567
ArticleSequenceNumber	:	46
ArticleCategory	:	Paper Report
ArticleFirstPage	:	1
ArticleLastPage	:	3
ArticleHistory	:	RegistrationDate : 2001–9–19 Received : 2000–11–13 Accepted : 2001–9–19 OnlineDate : 2001–9–19
ArticleCopyright	:	Biomed Central Ltd2001
ArticleGrants	:	
ArticleContext	:	129312211

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Keywords

Asthma, eosinophils, IL-5, LT D_4 receptor

Context

Leukotrienes are important mediators in the pathogenesis of acute bronchoconstriction, chronic airway inflammation and persistent eosinophilia in the airways and blood of asthmatics. The main source of leukotrienes in the asthmatic lung is the eosinophil. Recently the receptor for leukotriene (LT) D_4 ($CysLT_1R$) was characterized and its expression on HL-60/eos cells was shown. Interleukin (IL)-5 is an important regulator of many eosinophil functions including chemotaxis, degranulation, and adhesion. This study used the model of HL-60/eos cells to determine the influence of IL-5 on the expression and function of $CysLT_1R$ in eosinophils.

Significant findings

IL-5 induced a concentration- and time-dependent augmentation of $CysLT_1R$ mRNA expression in HL-60/eos cells. The accumulation of $CysLT_1R$ mRNA was abrogated by pretreatment of the cells with actinomycin D (an inhibitor of RNA synthesis), suggesting an enhancement of transcription as the underlying mechanism. Furthermore, IL-5-induced transcription of $CysLT_1R$ mRNA was associated with an increased expression of $CysLT_1R$ protein on the cell surface of HL-60/eos cells. The up-regulation of $CysLT_1R$ expression led to an elevated calcium flux in response to LT D_4 and an enhanced chemotactic response of HL-60/eos to LT D_4 - thus demonstrating the functional importance of the IL-5 induced $CysLT_1R$ expression.

Comments

This paper presents a new pathophysiologic mechanism by which IL-5 exerts its role on eosinophils and provides further insight into the involvement of IL-5 in the pathogenesis of asthma and allergic diseases. IL-5 modulates the expression of $CysLT_1R$ and thus determines the response of eosinophils to LT D_4, a potent stimulator of the inflammatory response. As shown in previous studies, IL-5 activates several other proteins involved in eosinophil growth and differentiation. The possible complex interaction of these proteins with the observed upregulation of $CysLT_1R$ by IL-5 requires further investigation. The knowledge of the exact pathway by which leukotrienes and their receptors are involved in the regulation of the immune response is especially important to enable the responsible use of leukotriene receptor antagonists in the treatment of asthma.

Methods

HL-60 cells, RT-PCR, northern blot, flow cytometry, Ca^{2+} mobilization assay, chemotaxis assay

Additional information

References

1. Thivierge M, Doty M, Johnson J, Stankova J, Rola-Pleszczynski M: IL-5 upregulates cysteinyl leukotriene 1 receptor expression in HL-60 cells differentiated into eosinophils. J Immunol. 2000, 165: 5221-5226.