Heewon Lee et al., J Allergy Ther 2017, 8:3(Suppl)
DOI: 10.4172/2155-6121-C1-006

Histamine-releasing factor is a potential therapeutic target for OVA-induced allergic rhinitis

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We first reported that translationally controlled tumor protein (TCTP) acts as a histamine-releasing factor (HRF) associated with chronic allergic disease when it forms dimers. Despite the lack of signal peptide, HRF was found in nasal lavages, skin blisters and bronchoalveolar lavage fluids in late phases of allergic reaction. In a preliminary study, we found a significant increase in serum HRF levels in patients with asthma and allergic rhinitis. These results have led us to investigate whether HRF can be a therapeutic target for allergic diseases. By screening a phage-displayed 7-mer peptide library, we identified one peptide that showed strong affinity for the dimer TCTP (dTCTP). The peptide named dTCTP-binding peptide 2 (dTBP2) blocked the action of HRF by inhibiting binding to the cell surface. Specifically, dTBP2 inhibited the release of IL-8, an inflammatory cytokine, by inhibiting dTCTP-induced NF-κB and MAPK from human bronchial epithelial cell line BEAS-2B. In addition, dTBP2 dose-dependently reduced the symptom score and eosinophil recruitment to the nasal mucosa in OVA-induced allergic rhinitis mouse model, suggesting that in vivo inflammation-mediated airway pathology was alleviated. In this study, we showed that inhibition of dTCTP could alleviate allergic pathology and showed that dTCTP could be a new drug target for chronic allergic diseases such as allergic rhinitis.

Biography

Heewon Lee is presently pursuing her MS-PhD integrated course in Pharmaceutical Sciences in College of Pharmacy, Ewha Woman's University, Seoul, Korea. She completed BS in Pharmacy College of Pharmacy, Ewha Woman's University, Seoul, Korea. She was awarded with University Scholarship & also has a Korean Pharmacist License. Her research includes studying the function of TCTP/HRF, a multifunctional protein. TCTP/HRF was found in body fluids of allergic patients and its importance was recognized, but the receptor and its mechanism of action were not yet known. Her ultimate goal was to find the HRF receptor, but attempts to isolate and identify it were unsuccessful. In the process, however, she discovered a functional domain that is thought to be the receptor binding domain of HRF. Antibodies targeting this region are being produced and the antibodies with good efficacy will be selected as HRF inhibitors.

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