

Birch pollen allergen immunotherapy normalizes nasal gene-expression and microbial community

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Birch pollen allergic rhinitis is the most common chronic disorder in the Northern part of the globe, and it attributes to significant morbidity and

economic burden.

According to the new study by researchers at the University of Helsinki, pollen allergen immunotherapy has favorable effects on the molecular events and microbiome profile in the nasal membrane.

The researchers studied five healthy, nonsmoking adult subjects and six allergic rhinitis patients longitudinally during two springs and two winters in 2011 and 2012. Half of the allergy patients started subcutaneous birch allergen immunotherapy after the first winter.

In total, 44 nasal brushings were subjected to RNA-sequencing analysis to find [gene expression](#) and microbial community changes driven by [allergic rhinitis](#) and allergen immunotherapy.

According to the results, the group who started allergen immunotherapy showed decreased symptom score and reprogramming of nasal epithelial transcriptome, set of RNA molecules, during the pollen season.

"The immunotherapy affected asthma-, chemokine signaling-, and toll-like-receptor-signaling-pathways in the spring. No major differential expression was found between the two winters in any group," says researcher Sanna Toppila-Salmi from the University of Helsinki and Helsinki University Hospital.

The results also indicated that microbial community diversity of the group that underwent allergen immunotherapy approached that of the healthy controls.

According to the researchers, the study shows that RNA sequencing is a promising method to monitor allergen immunotherapy response.

More information: Tanzeela Hanif et al. Birch pollen allergen

immunotherapy reprograms nasal epithelial transcriptome and recovers microbial diversity, *Journal of Allergy and Clinical Immunology* (2019).
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