OncoGen research center

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The affliction given by exposure to Ragweed and HDM extracts on bronchial epithelial cells in transwell culture system

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INTRODUCTION

A wide variety of aeroallergens can induce inflammation of the respiratory tract and trigger an allergic response. The most common types of allergens involved are ragweed pollen and house dust mite allergens (HDM). In order to assess their impact on bronchial epithelial cell barrier function, we used *in vitro* cultivated normal human bronchial epithelial cells (NHBE) that were exposed to these allergen extracts.

AIM

This study evaluates and compares the effects of exposure to ragweed and HDM extract on bronchial epitelium.

METHODS

The NHBE cells were cultured in the transwell system at the air-liquid interface to simulate normal bronchial epithelium. Afterwards, the cells were exposed to ragweed and HDM extracts at a concentration of 100 µg/mL or a combination of the both extracts at a concentration of 200 µg/mL. Subsequently, we assessed the trans-epithelial electrical resistance (TEER) values periodically for the first 4 hours, then daily for 72 hours for the first exposure, than we reexposed the cells to the oposite allergen (excepting the allergen combination which remained the same) and appraised the TEER values using the same timetable.

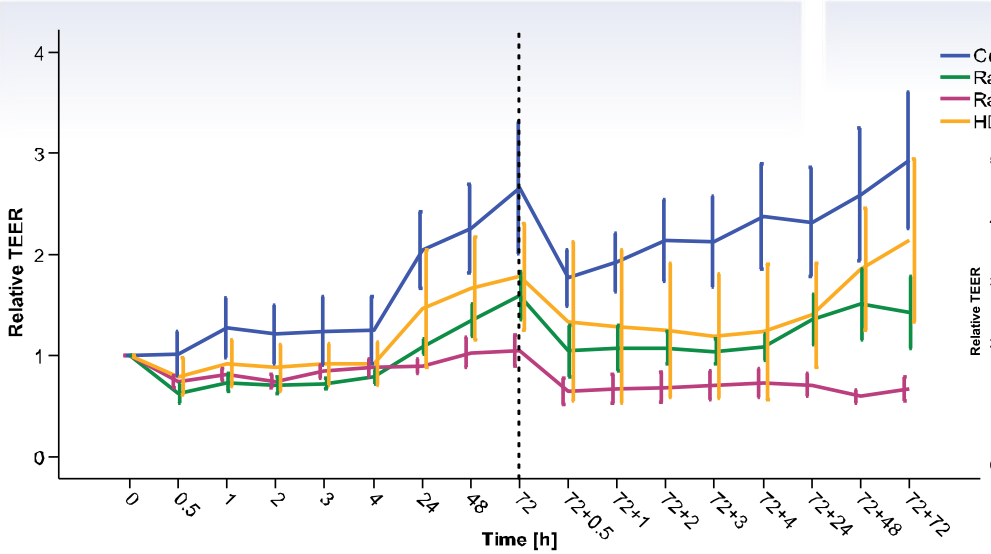

Fig. 1. Changes in TEER values after allergen exposure

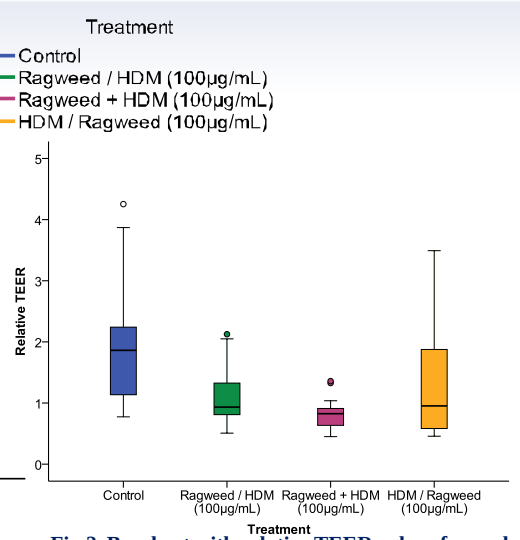

Fig.2. Barchart with relative TEER values for each treatment group

RESULTS AND SIGNIFICANCE

The measurements showed a substantial decrease of TEER values in the treated cells when comparing all the allergen exposures that have been tested to the control plot. The most important effect on bronchial human cells was obtained by the continuous exposure to the combination of HDM and ragweed extracts. This appeared to be significantly more damaging than the individual exposure to allergen extracts, even though there has not been a significant difference between the exposures to the individual allergen extracts.

CONCLUSIONS

The exposure to the combination of HDM and ragweed allergens has a tremendous impact on the integrity of normal bronchial epithelium leading to a cell barrier-disrupting effect and could play an important role in the process of allergic sensitization.