

MEETING ABSTRACT

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# Bronchial hyperreactivity induced by tropomyosins from cockroach and shrimp: a mouse model to study *in vivo* cross-reactivity

Thalita Martins\*, Marina Dias, Rafael Prado, Thamires Milani, Adriana S Moreno, Luana Maia, Vânia Bonato, Simone Ramos, Marcos Borges, L Karla Arruda

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## Background

*In vivo* cross-reactivity among tropomyosins, major pan-allergens among invertebrates, is not established. Our aim was to investigate the effects of purified tropomyosins from cockroach (recombinant Per a 7) and shrimp (natural Lit v 1) on airway inflammation and hyperresponsiveness in a mouse model of asthma.

## Methods

Balb/c mice, 4 to 6 weeks-old, were sensitized twice with 50µg of rPer a 7 or nLit v 1 intraperitoneally with 1 mg alum, and challenged with 50µg of rPer a 7 or nLit v 1 intranasally for three days. A group was sensitized with rPer a 7 and challenged with nLit v 1 under same conditions. Controls received saline on same days. Twenty-four hours after the last challenge, mice were ventilated with FlexiVent®, and *in vivo* bronchial hyperresponsiveness was evaluated with increased doses of inhaled methacholine (6.25, 12.5, 25 and 50mg/ml). After ventilation, bronchoalveolar lavage fluid (BALF) was collected and cell counts were performed.

## Results

Sensitization and challenge of mice with rPer a 7 or nLit v 1 resulted in increase in bronchial hyperresponsiveness, given by increase in total and tissue resistance and elastance. Total cells in BALF increased in rPer a 7 ( $1 \times 10^5$  vs  $3 \times 10^5$ ,  $p < 0.01$ ) and nLit v 1 ( $1 \times 10^5$  vs  $1 \times 10^6$ ,  $p < 0.001$ ) groups, as compared to controls. There was increase in macrophages for rPer a 7 ( $5 \times 10^4$  vs  $1 \times 10^5$ ,  $p < 0.001$ ) and nLit v 1 ( $5 \times 10^4$  vs  $3 \times 10^5$ ,  $p < 0.001$ ) and eosinophils for rPer a 7 ( $2 \times 10^3$  vs  $1.4 \times 10^5$ ,  $p < 0.001$ ) and nLit v 1 ( $2 \times 10^3$  vs  $9.1 \times 10^5$ ,  $p < 0.001$ ). Mice immunized

with rPer a 7 and challenged with nLit v 1 showed no changes in bronchial hyperresponsiveness or eosinophils on BALF as compared to controls ( $2 \times 10^3$  vs  $6 \times 10^3$ ). However, there was an increase in neutrophils in this group as compared to controls ( $5 \times 10^4$  vs  $1 \times 10^5$ ,  $p < 0.01$ ).

## Conclusions

Experimental asthma induced by purified tropomyosins from cockroach and shrimp mimicked the main characteristics of human asthma. Despite the high degree of sequence identity and IgE immunologic cross-reactivity, our data suggested that *in vivo* cross-reactivity of these tropomyosins is unlikely.

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School of Medicine of Ribeirao Preto - University of Sao Paulo, Brazil



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