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Consecutive food and respiratory allergies amplify systemic and gut but not lung outcomes in mouse .



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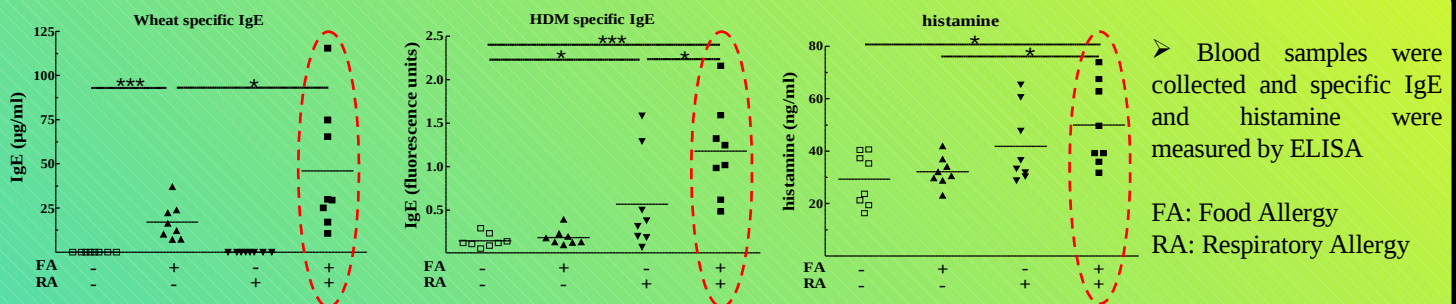
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Background: The increase prevalence of atopic disease has become a major challenge for allergists and public health authorities. The natural history of the atopic march is still very poorly understood.

Aim: Establishment of a new mouse model combining food and respiratory allergy define a way to analyse the atopic march by investigating immunological and physiological parameters.

Methods: Mice were sensitized to wheat allergens by intraperitoneal and oral administration and then exposed to house dust mite allergens in intranasal. Allergic reaction was monitored by measuring levels of IgE and histamine. Then, immune response was evaluated by cell number and cytokine production in lymphoid organs, gastro-intestinal tract and respiratory tract. Physiological parameters were also analysed by exploring paracellular and transcellular permeability as well as airway hyper-responsiveness.

Additive effect on blood marker of allergy:



➤ Blood samples were collected and specific IgE and histamine were measured by ELISA

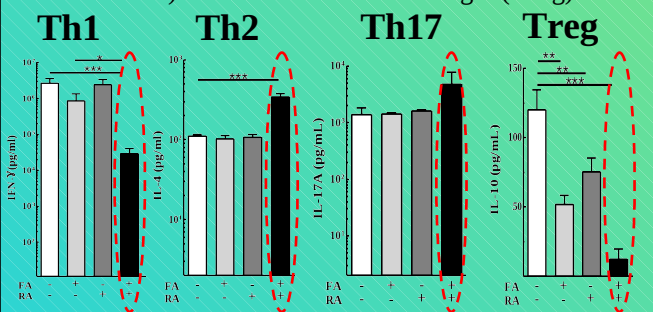
FA: Food Allergy
RA: Respiratory Allergy

➤ Mice double exposed to allergen (HDM and wheat) showed higher level of blood marker of allergy compared to single exposed mice or control revealing additive effect.

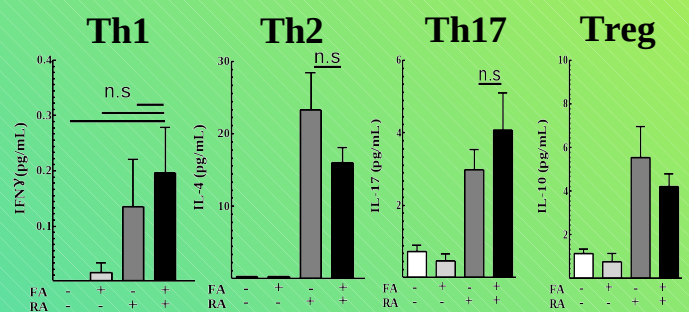
Double allergy drives T-helper response in an organ specific manner:

Gastro-intestinal Tract

➤ Cytokine were measured by ELISA in cell culture supernatants after non specific activation from either Peyer patches (Gastro-intestinal tract) and Broncho-alveolar lavages (Lung).

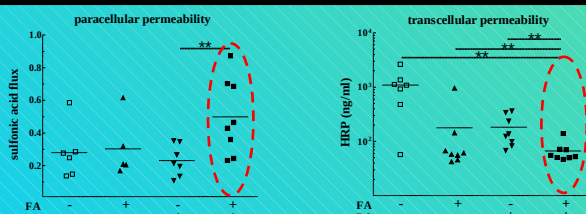


Lung

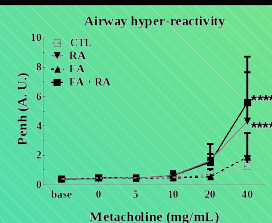


➤ Double allergy promotes Th2 and Th17 environment together with inhibiting Th1 response and tolerance specifically in intestinal without perturbing lung.

Mix allergy exacerbates intestinal symptoms but not respiratory parameters:



➤ Alteration of intestinal physiology in mice exposed to both allergy.



➤ Combined allergies do not influence lung function

➤ Exposure to food and respiratory allergens induced systemic response with an organ specific effect impacting allergic pathology evolution.