



# SELECTED OPPORTUNITIES IN ALLERGIC ASTHMA

Methods and composition for the treatment of allergic asthma (BIO 17336)

### ▶ **Product:**

- ◆ Tested: polypeptide derived from a mite allergen (Der p 2.1)
- ◆ Could be generated: new formulation of Der p 2.1 for topic or oral administration

### ▶ **Application:**

- ◆ Allergic Asthma

### ▶ **Rational:**

- ◆ The major allergen of the house-dust mite *Dermatophagoides pteronyssimus* Der p 2 is a 146-amino acid protein which is further processed into a secreted mature form of 129 amino acids) after cleavage of the signal peptide (amino acids 1-17)
- ◆ Two recombinant fragments of Der p 2 (rDer p 2.1 consisting of amino acids 1 to 53 of the mature form Der p 2 and rDer p 2.2 consisting of amino acids 54 to 129) exhibited less in vivo allergenic activity and allergenicity than the Derp 2 allergen but preserved immunogenicity and may represent candidates for specific immunotherapy of house-dust mite allergy
- ◆ However, the effects of the Derp 2 allergen or derivatives thereof such as rDer p 2.1 and rDer p 2.2 on the respiratory function have never been studied

### ▶ **POC:**

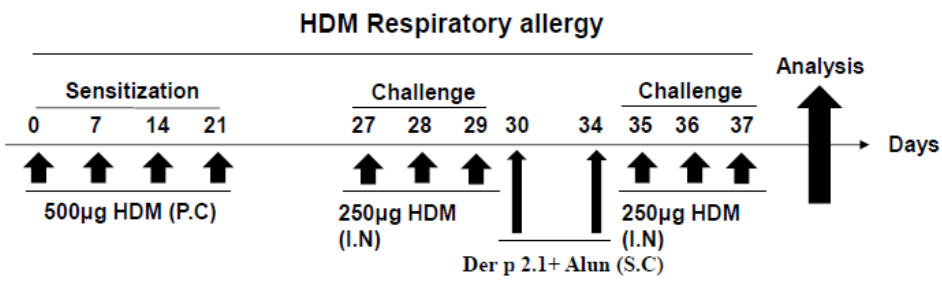
- ◆ Mice model of severe allergic asthma induced by intranasal administration of House Dust Mite
- ◆ When injected twice the polypeptide derp2.1 in the mouse model after a third asthma attack, the mouse presents a respiratory improvement, reduction of neutrophils and eosinophils in the broncho-alveolar lavage (BAL), an increase of regulators lymphocytes T and reduction of natural killer cells in the BAL

### ▶ **Patent and publication:**

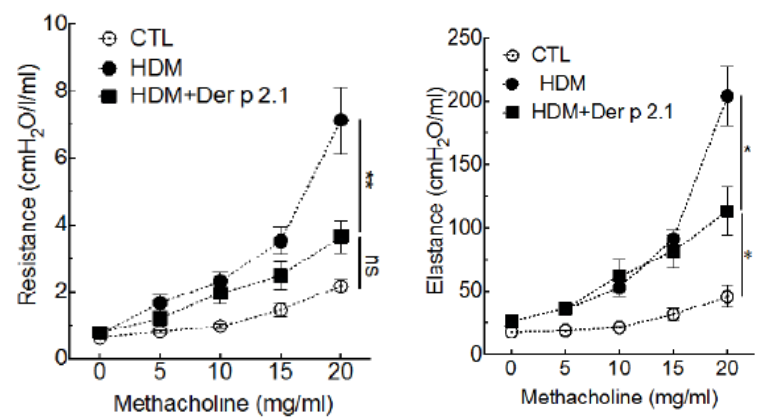
- ◆ PCT/EP2019/055273: METHODS AND COMPOSITION FOR THE TREATMENT OF ALLERGIC ASTHMA
- ◆ *Prevention of allergic asthma through Der p 2 peptide vaccination.* Bouchaud G. *et al.* J Allergy Clin Immunol. 2015 Jul;136(1):197-200.

## Proof of concept

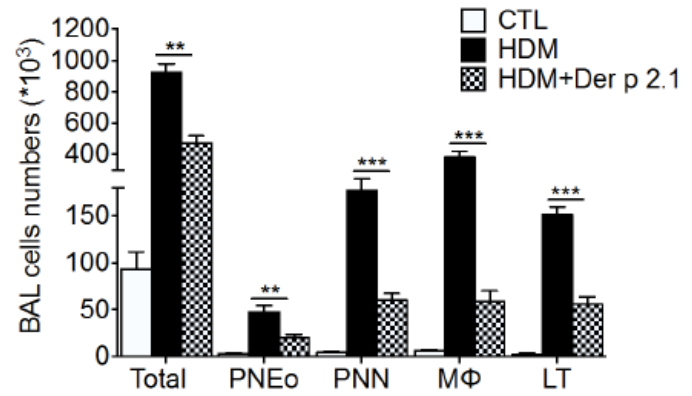
### Mouse model of HDM-induced asthma and Derp 2.1 therapeutic potential on hyper responsiveness BAL and lung infiltrate



Schematic representation of the HDM allergic model



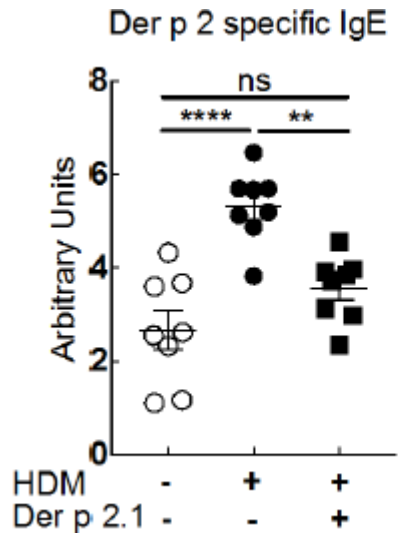
Measurement of airway resistances and elastance to increasing doses of ethacholine in CTL (white circles), asthmatic-like (HDM; black circles) and treated mice (Derp2.1; black squares) on day 38 (n=7-9 mice/group)



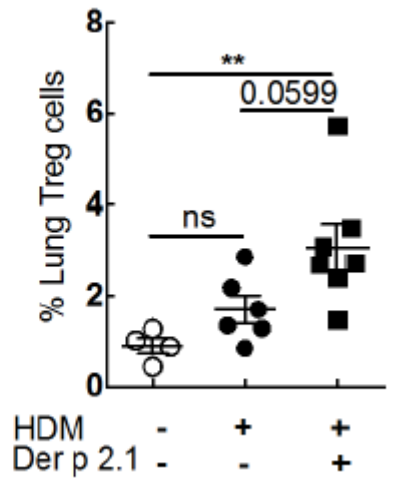
Total cells, lymphocytes (LT), macrophages (MΦ), neutrophils (PNN) and eosinophils (PNEo) counts in BAL (day 38) in CTL (white bars), asthmatic-like (HDM; black bars) and treated mice (Derp2.1; black squares bars).

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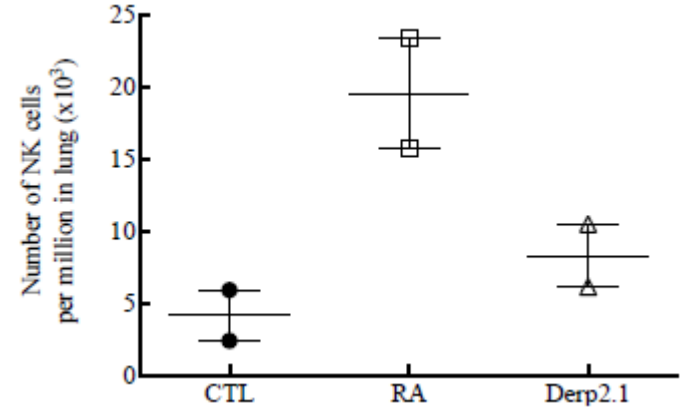
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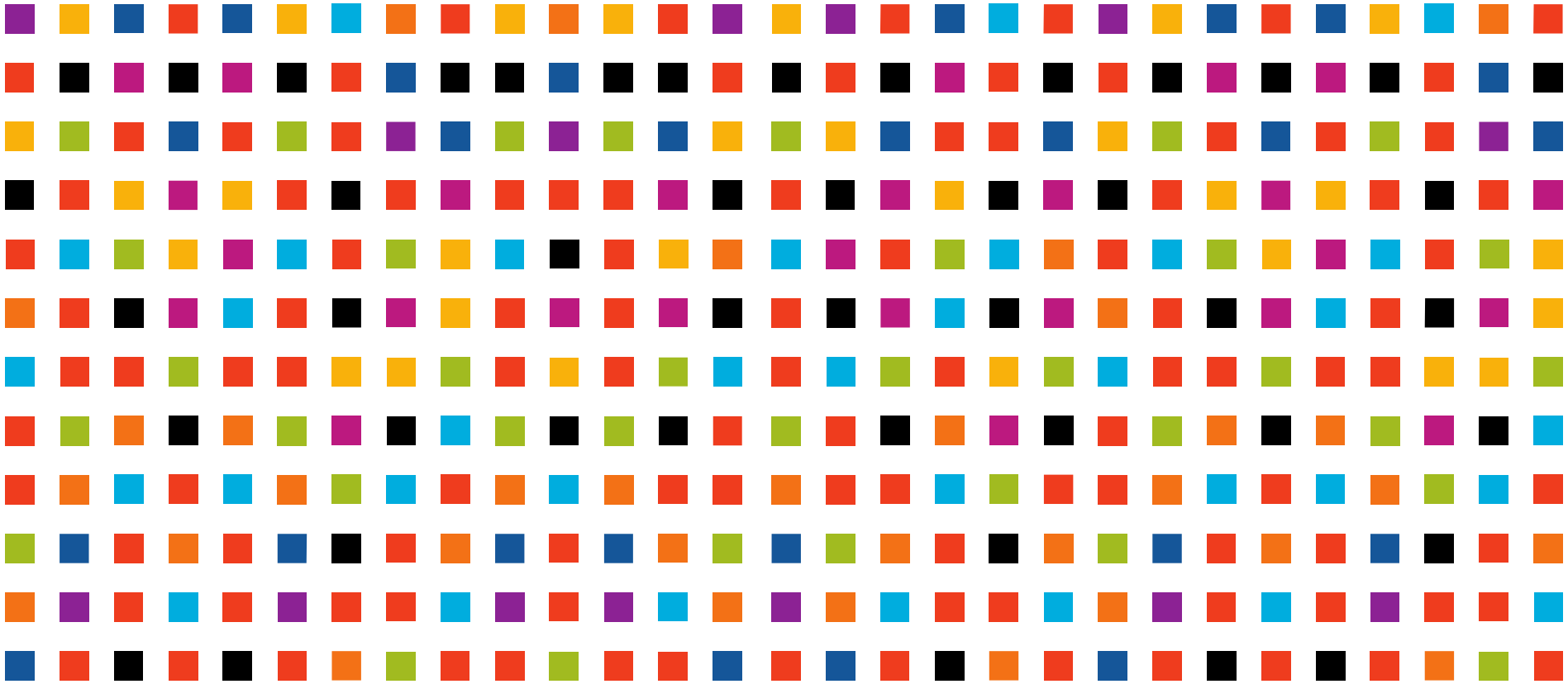
Serum level of Der p 2-specific IgE in CTL (white circles), asthmatic-like (HDM; black circles) and treated mice (Derp2.1; black squares)



Frequency of lung Treg cells (n=4/7 mice/group).



Number of lung natural killer cells (n=2 mice/group) in CTL (black circles), asthmatic-like (RA; white squares) and treated mice (Derp 2.1; white triangle).



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