Dupilumab *vs.* Abrocitinib:

Distinct Impacts on Basophil Modulation in AD

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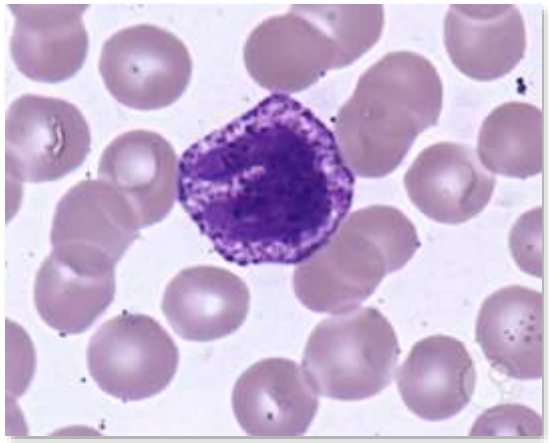
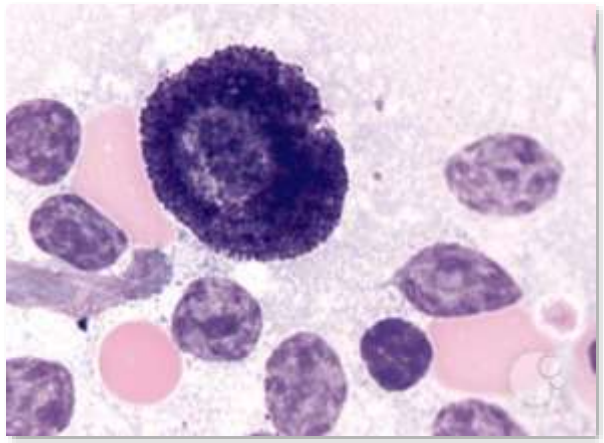
1 BASOPHILS BIOLOGY

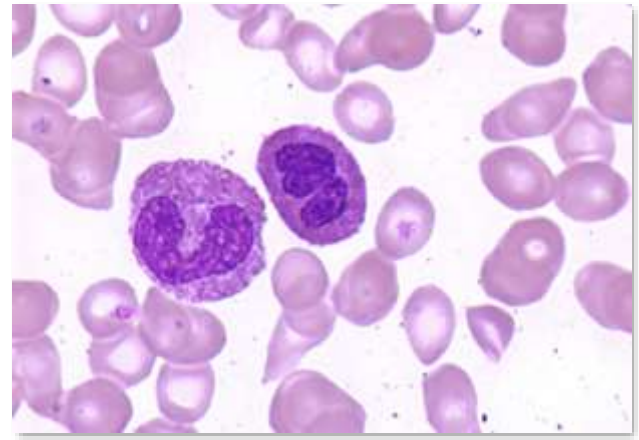
Basophils, Mast cells, Eosinophils



Basophils



Mast cells

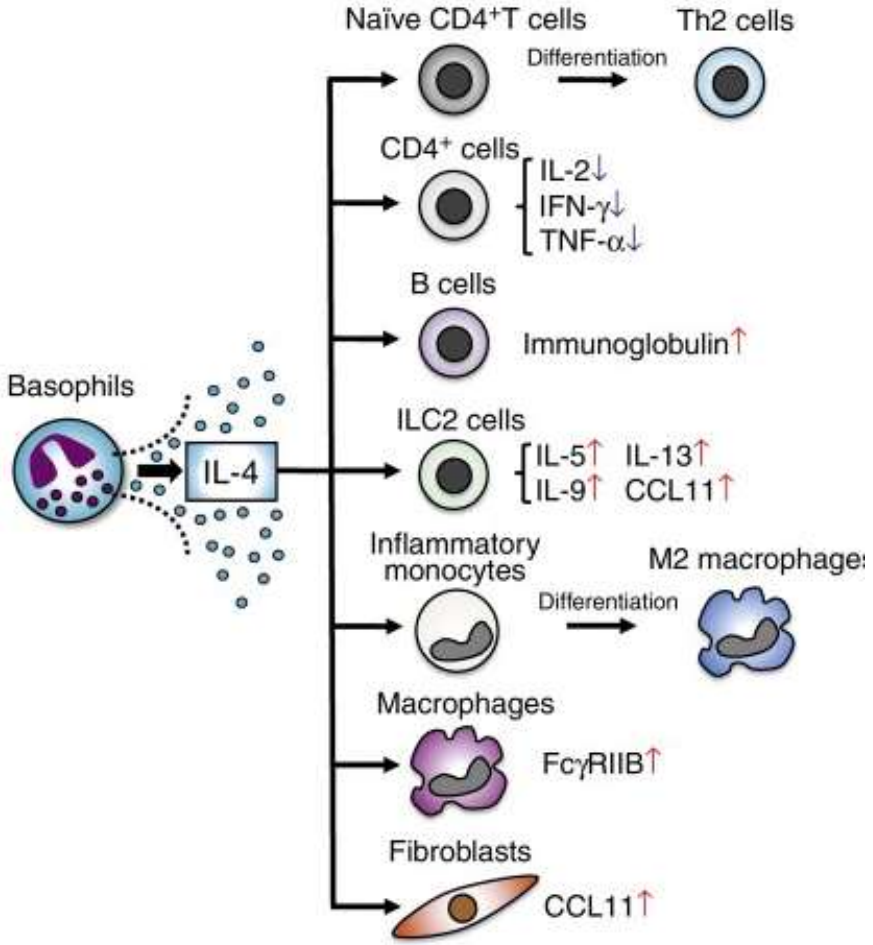


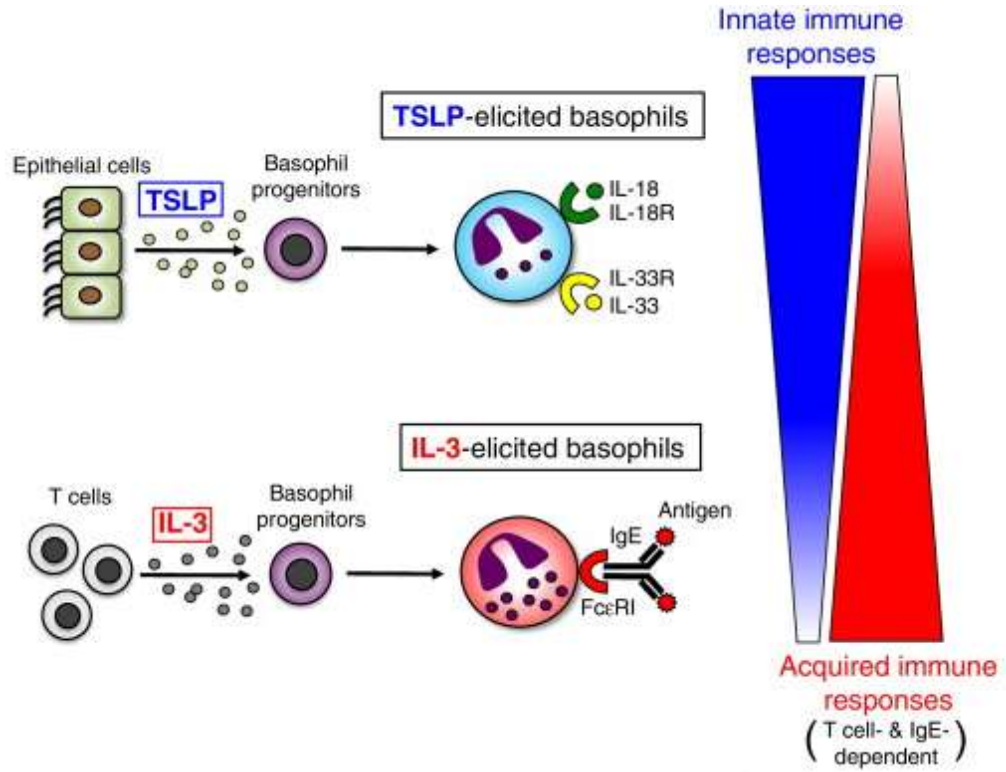
Eosinophils

- Basophils, eosinophils and mast cells were first recognized by Paul Ehrlich in the late 19th century.
- These cells have common, but non-redundant roles, in the pathogenesis of allergic diseases and in the protection against parasites.
- These cells exert different effector functions beside the expression of very similar receptors and cytokines.

Rigoni et al. *Seminars in Immunology.* 2018

Biological Function of Basophils





Karasuyama H, *Curr Opin Immunol*. 2014

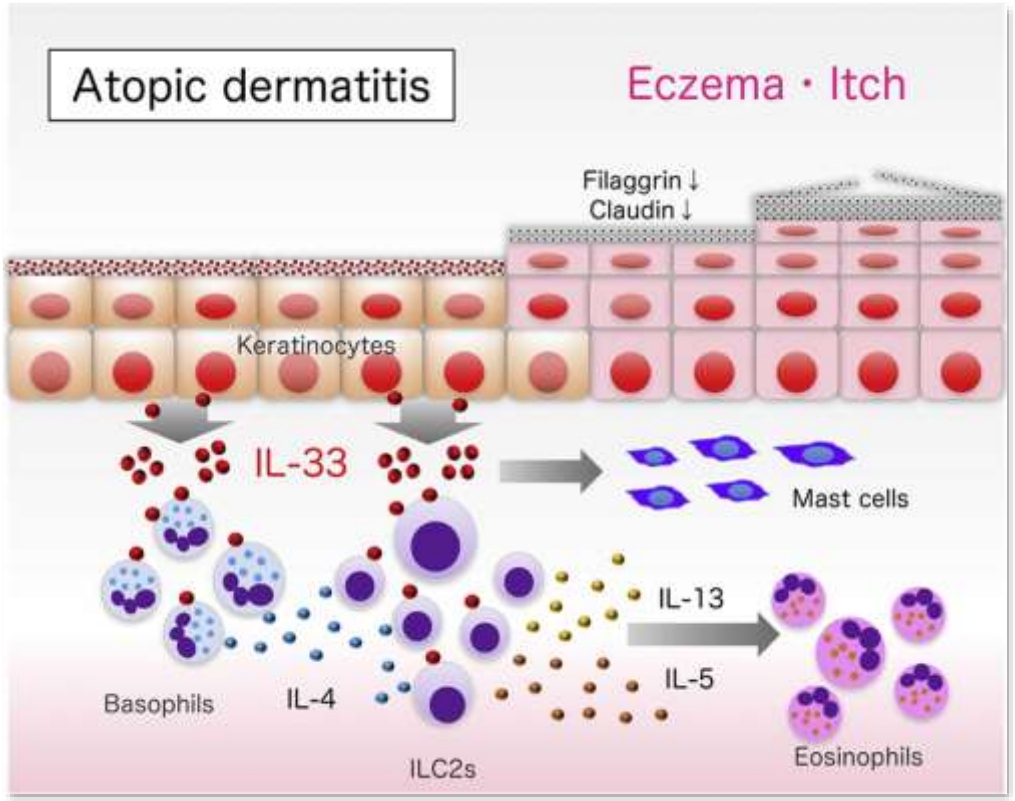
2 BASOPHILS IN ATOPIC DERMATITIS

AD: a common chronic skin disease

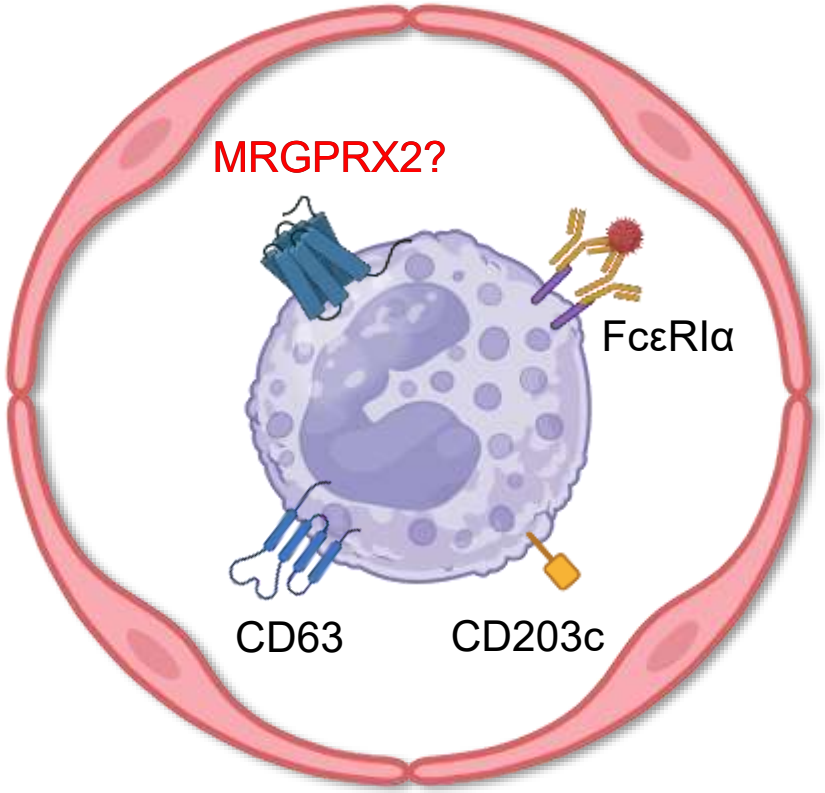
Adapted from Langan et al. *Lancet* 2020 with pictures captured by Dr. Fang Wang

Basophil: an important player in AD pathogenesis

AD Mechanisms

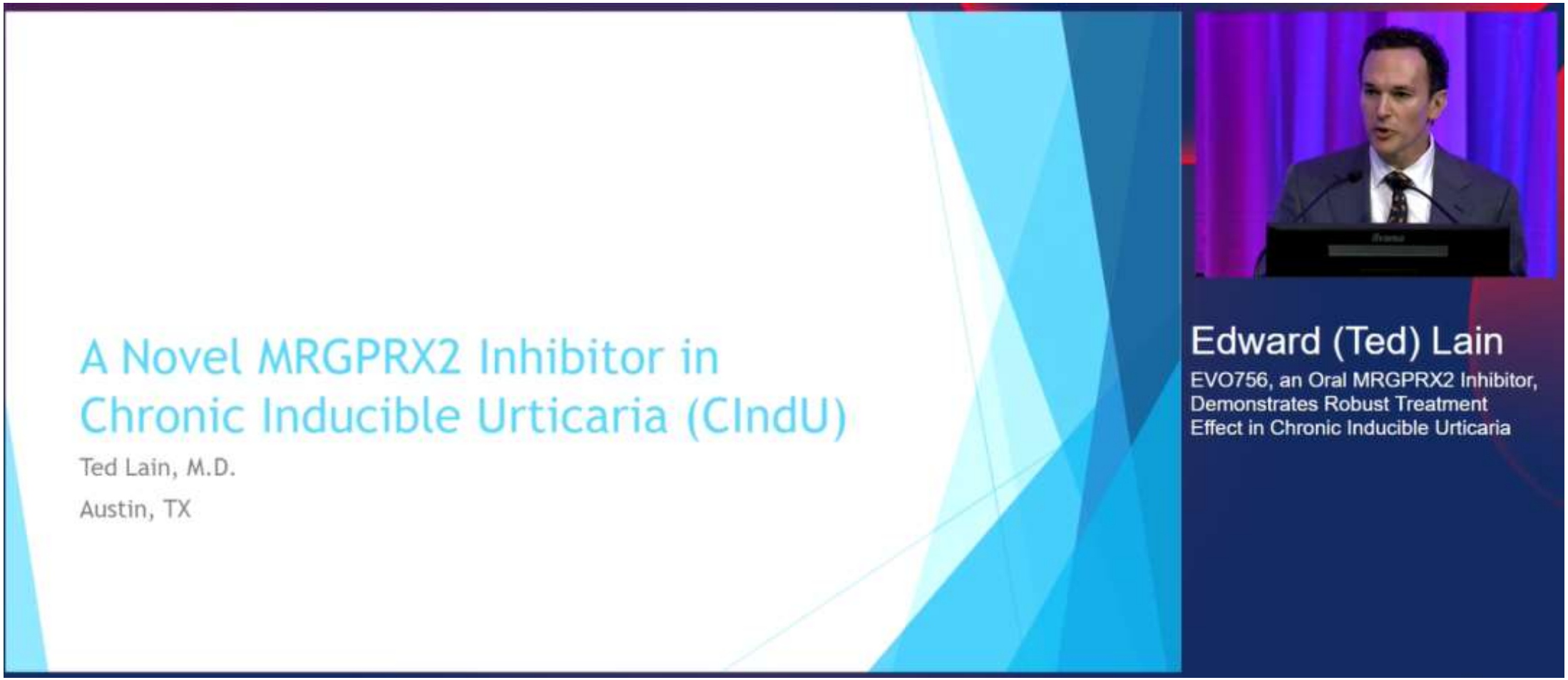


Basophil Characteristic



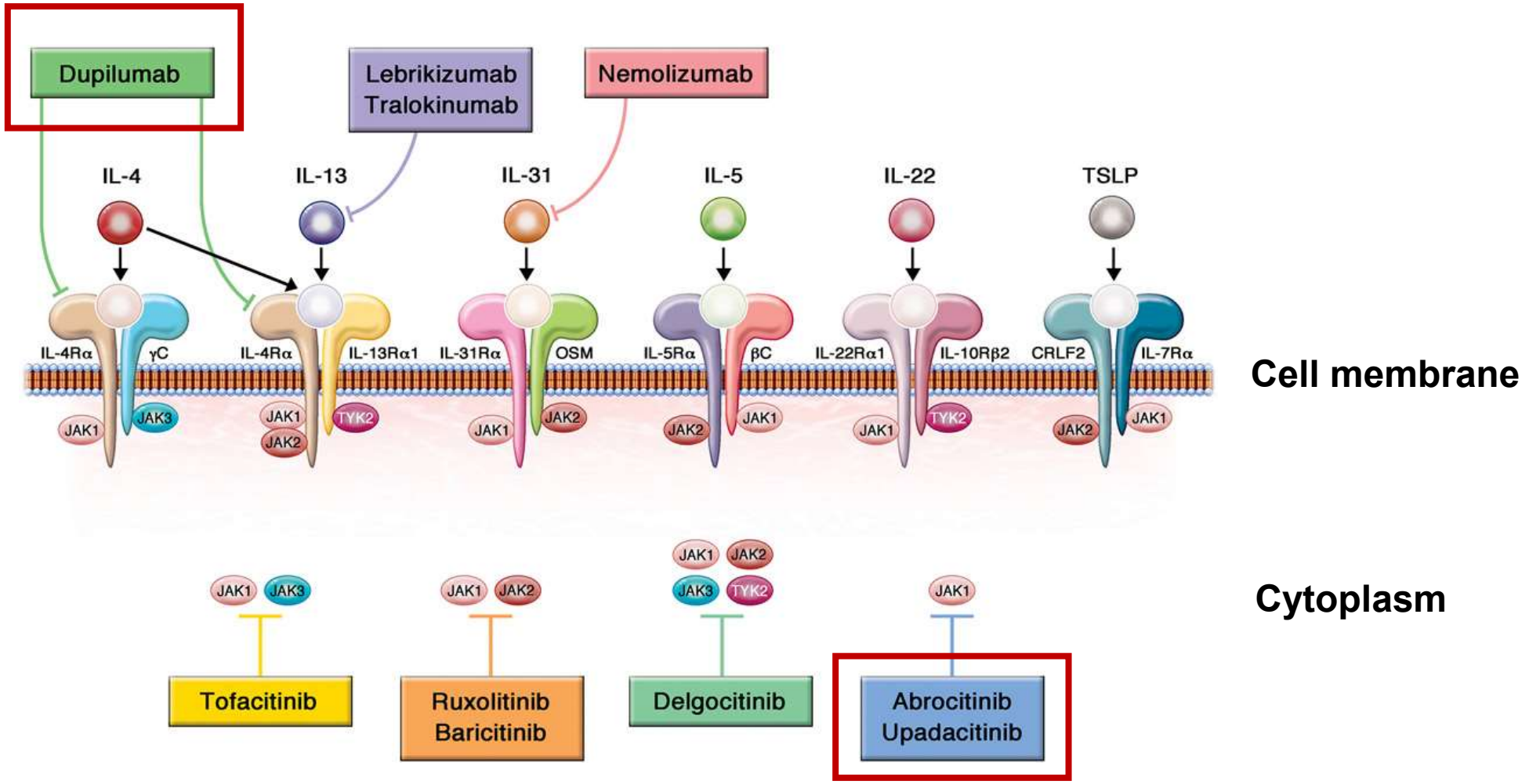
Imai et al. *J Invest Dermatol*. 2019

EVO756, an oral MRGPRX2 inhibitor, in a clinical trial



EADV Conference, 2025

Impact of dupilumab *vs.* abrocitinib on basophils?



Chovatiya R et al. *J Allergy Clin Immunol.* 2021

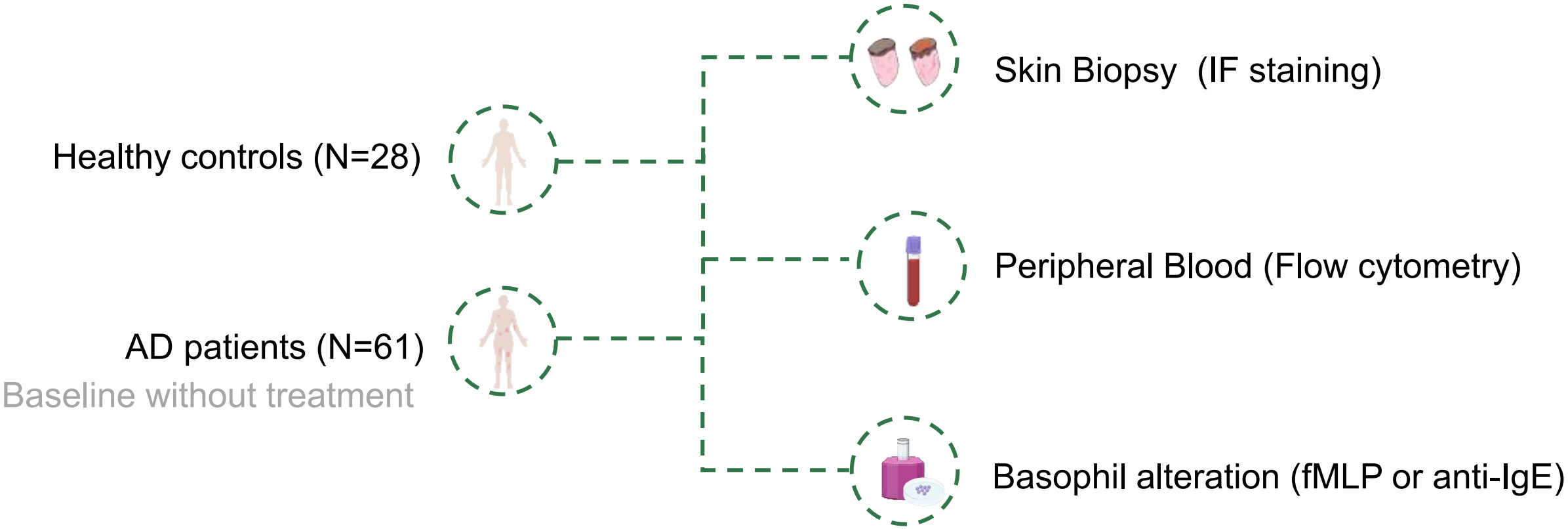
Two scientific questions

01 **Comparative phenotype of basophils in AD patients and HCs.**

02 **Basophil alterations in AD following different medications.**

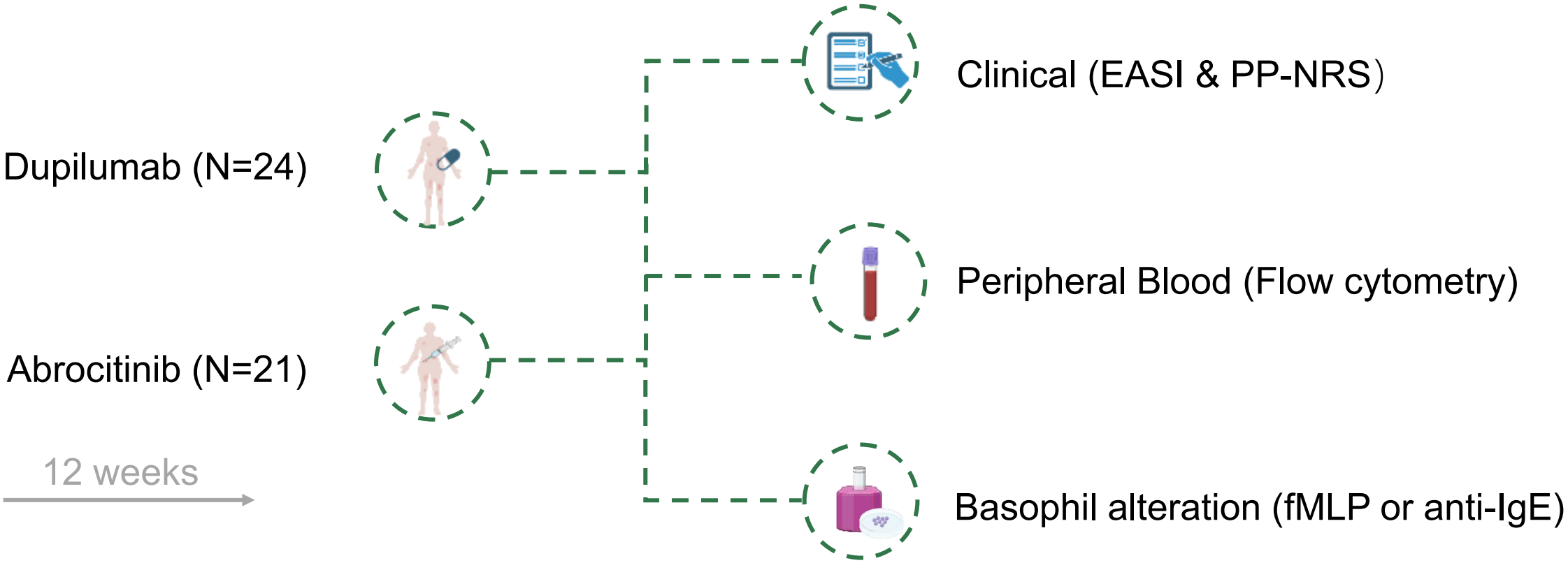
Study design

Q1: Comparative phenotype of basophils in AD patients and HCs.

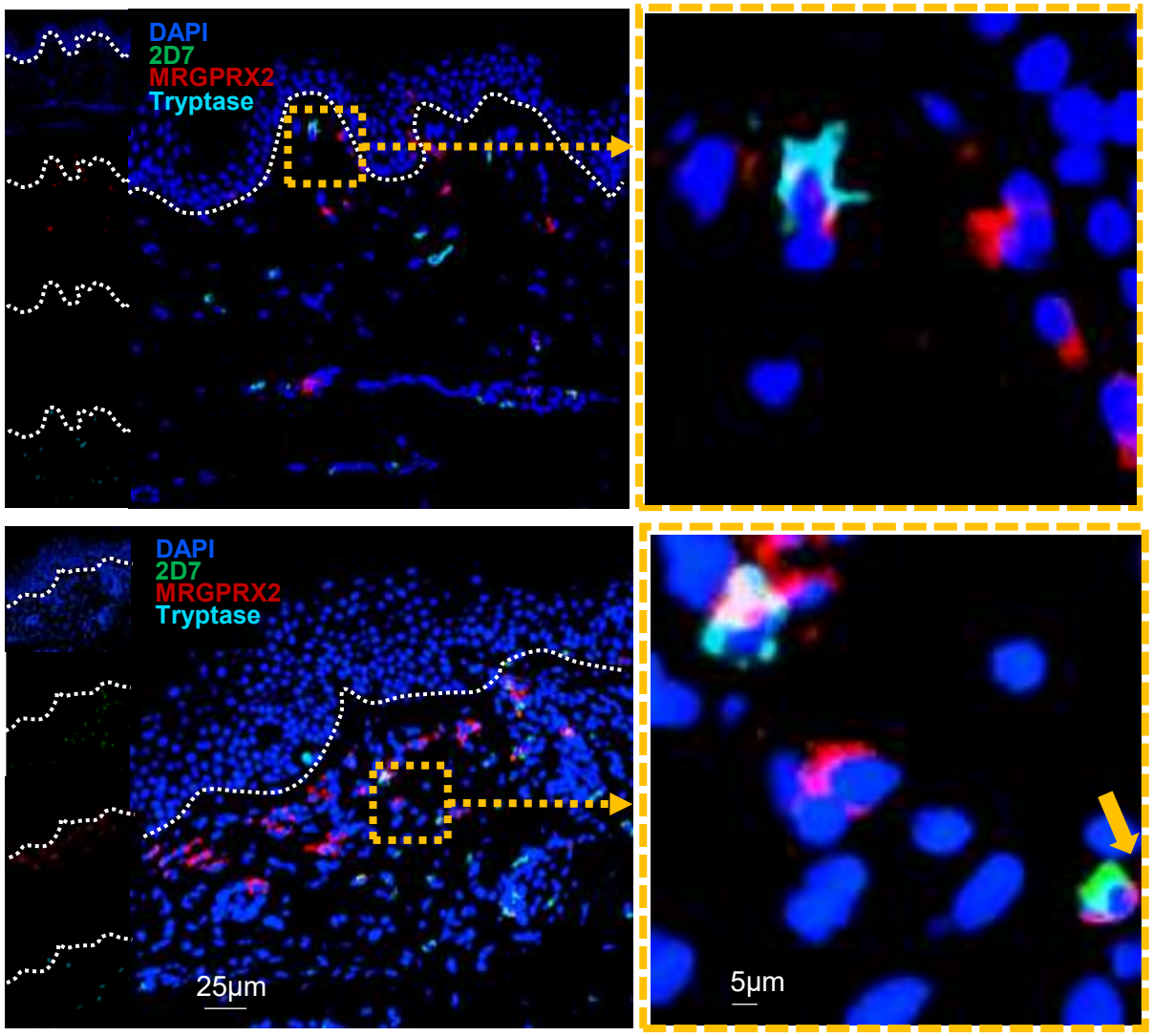


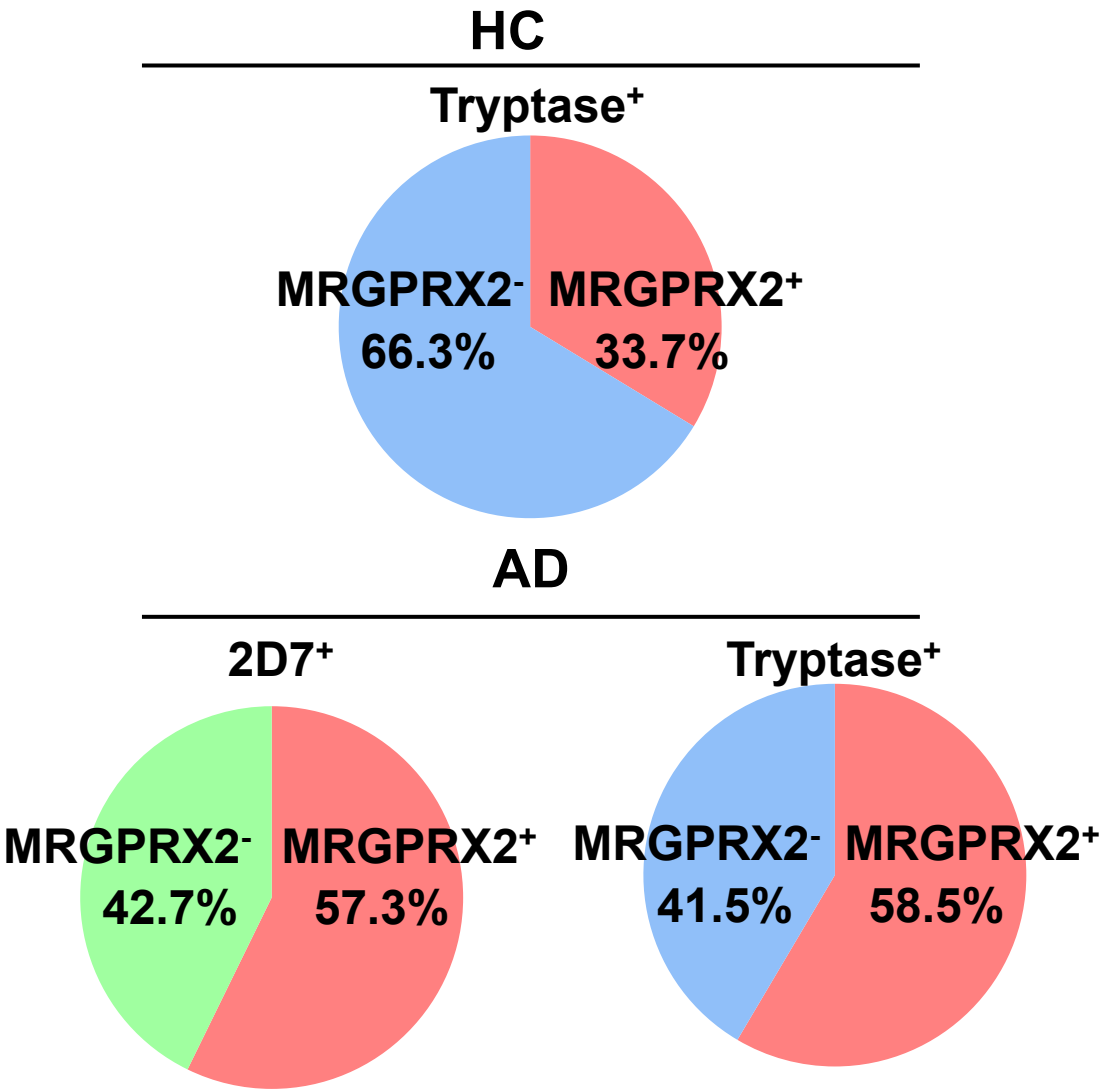
Study design

Q2: Basophil alterations in AD following different medications.



MRGPRX2$^+$ basophils infiltrate in AD lesional skin

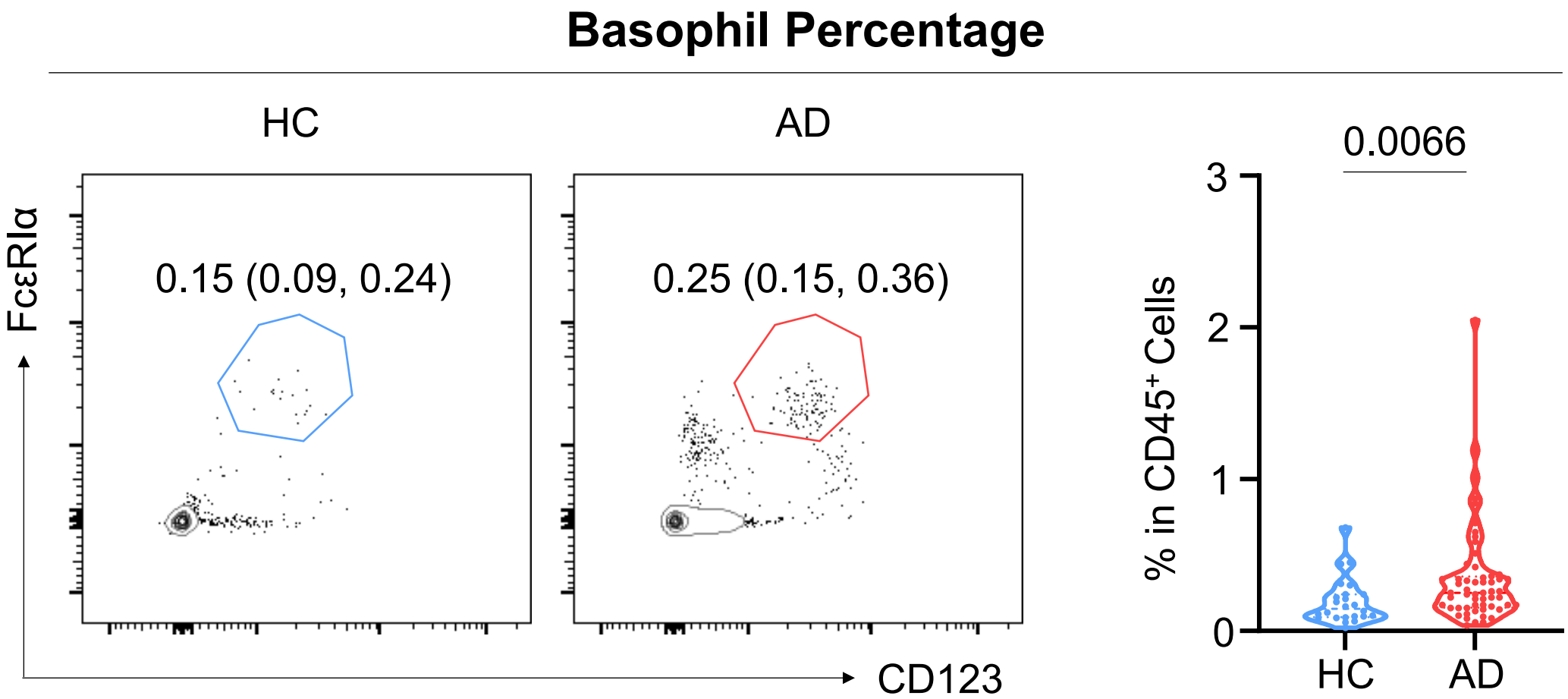




2D7: basophil biomarker

Unpublished

Circulating basophils are increased in AD



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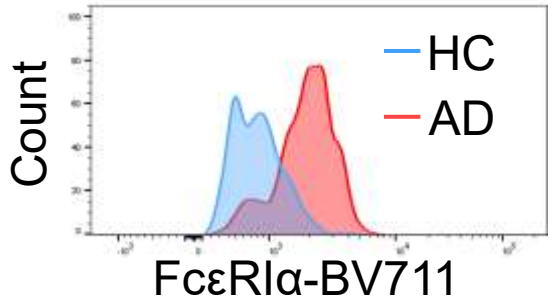
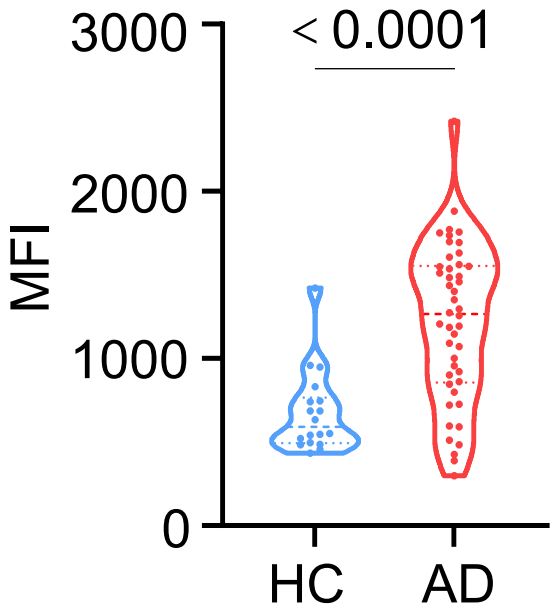
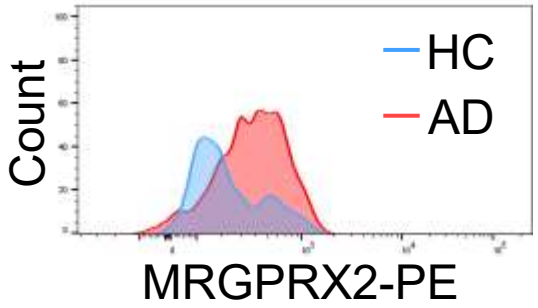
Both IgE and non-IgE pathways are upregulated in basophils

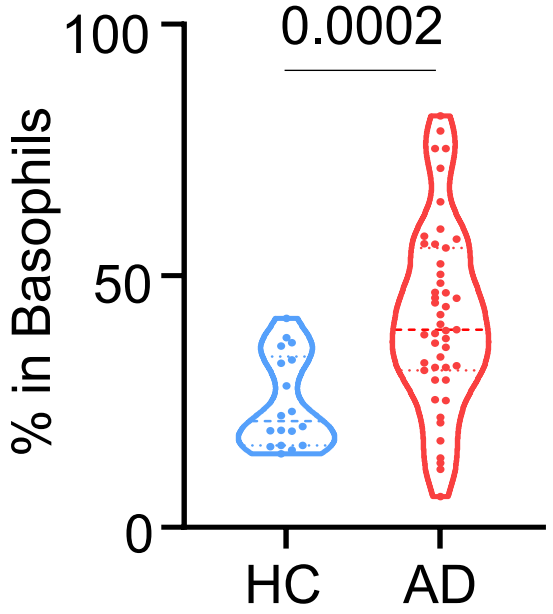
FcεRIα





MRGPRX2





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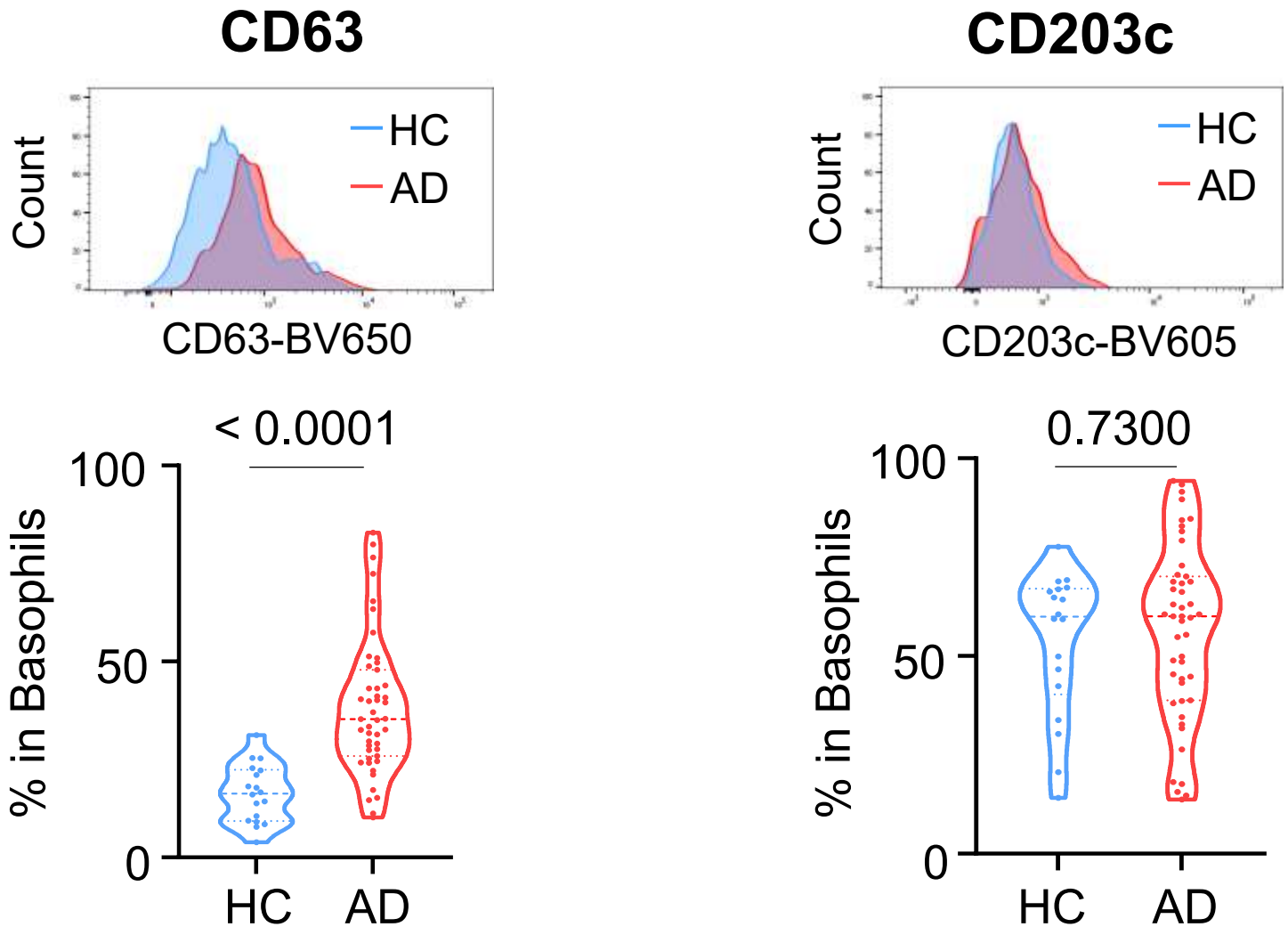
Basophils are partially activated in AD



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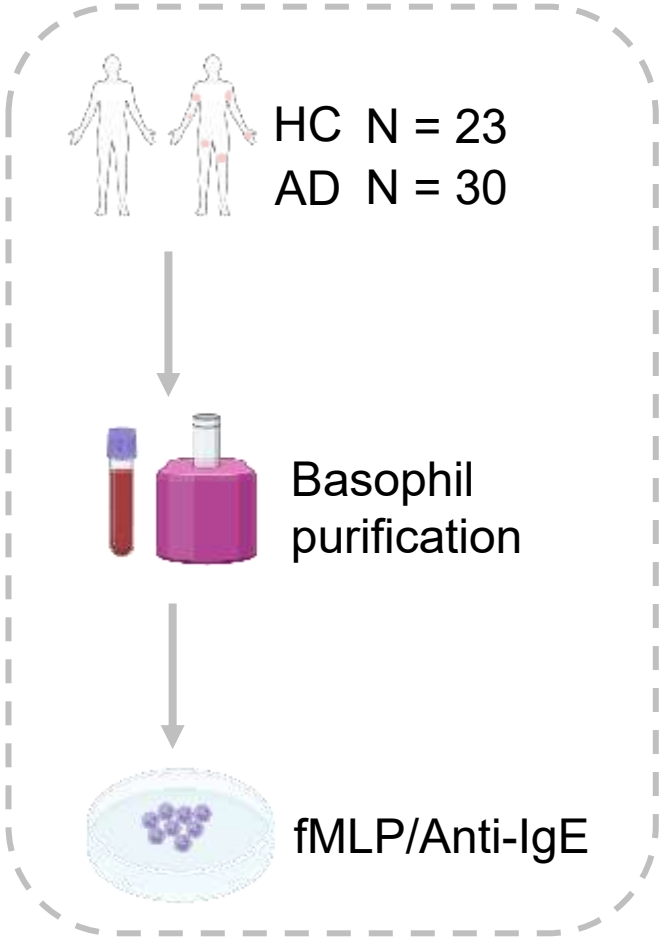
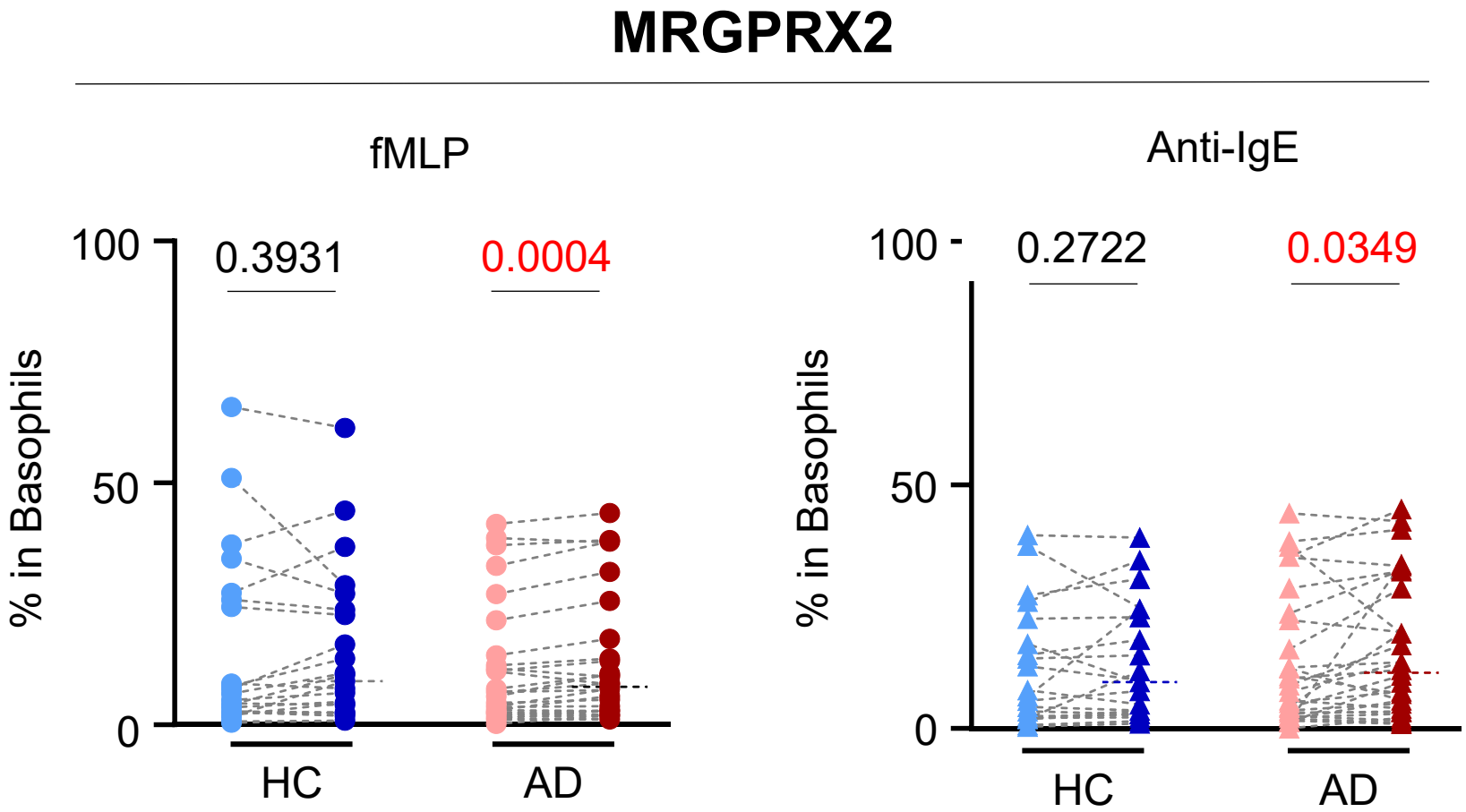
MRGPRX2 can be upregulated through stimulation in AD patients





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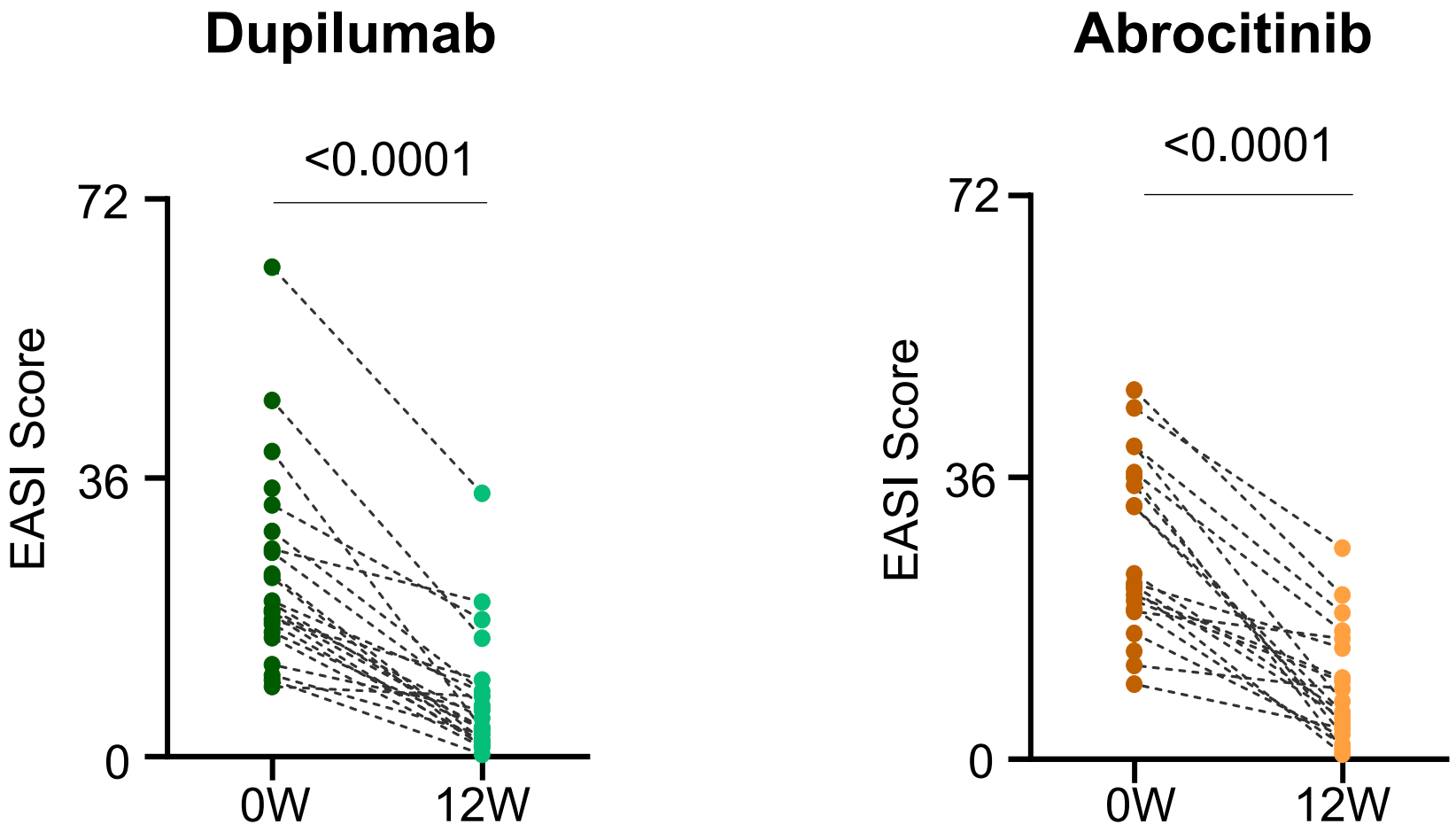
Skin inflammation is improved following treatment



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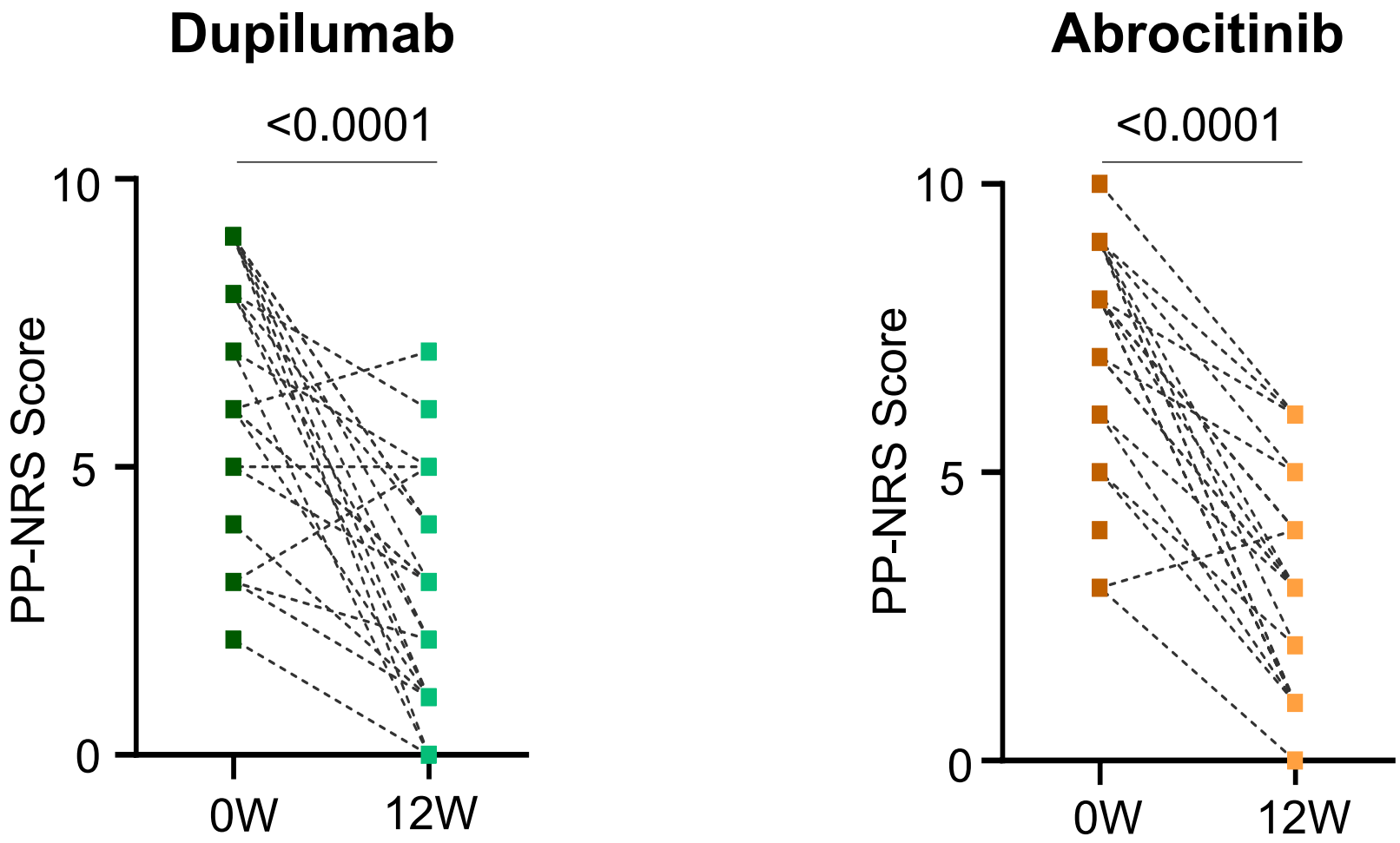
Pruritus is alleviated following treatment



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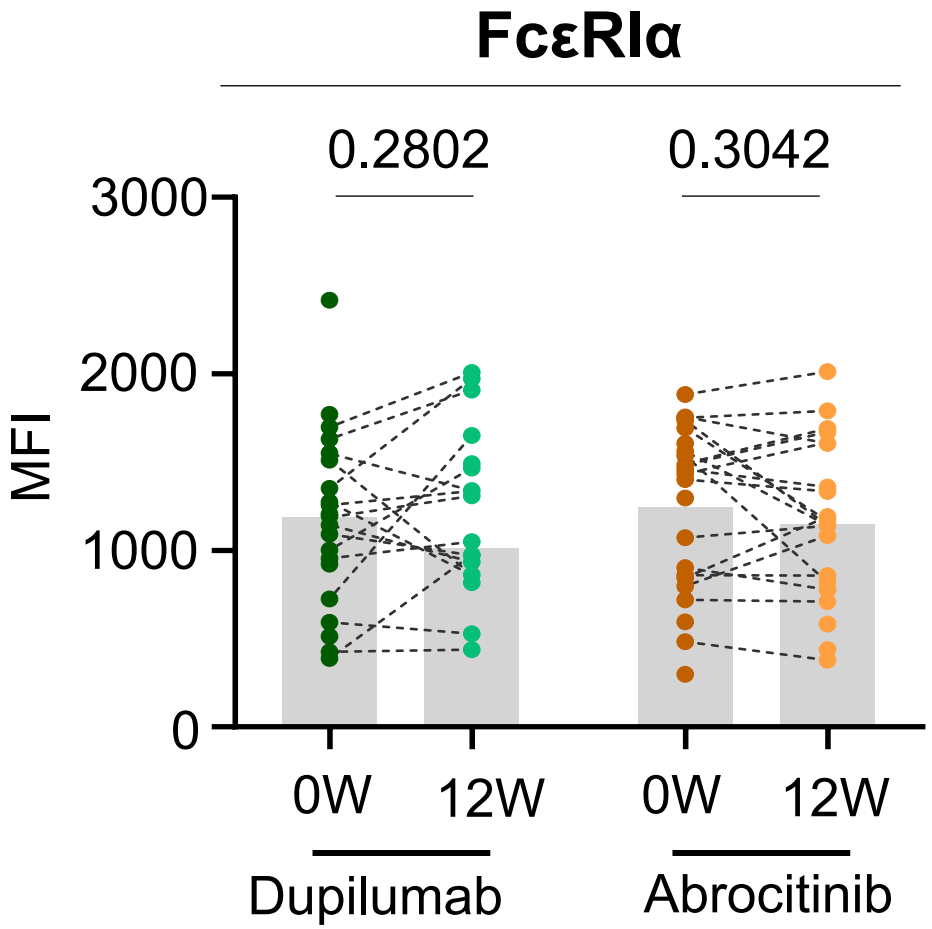
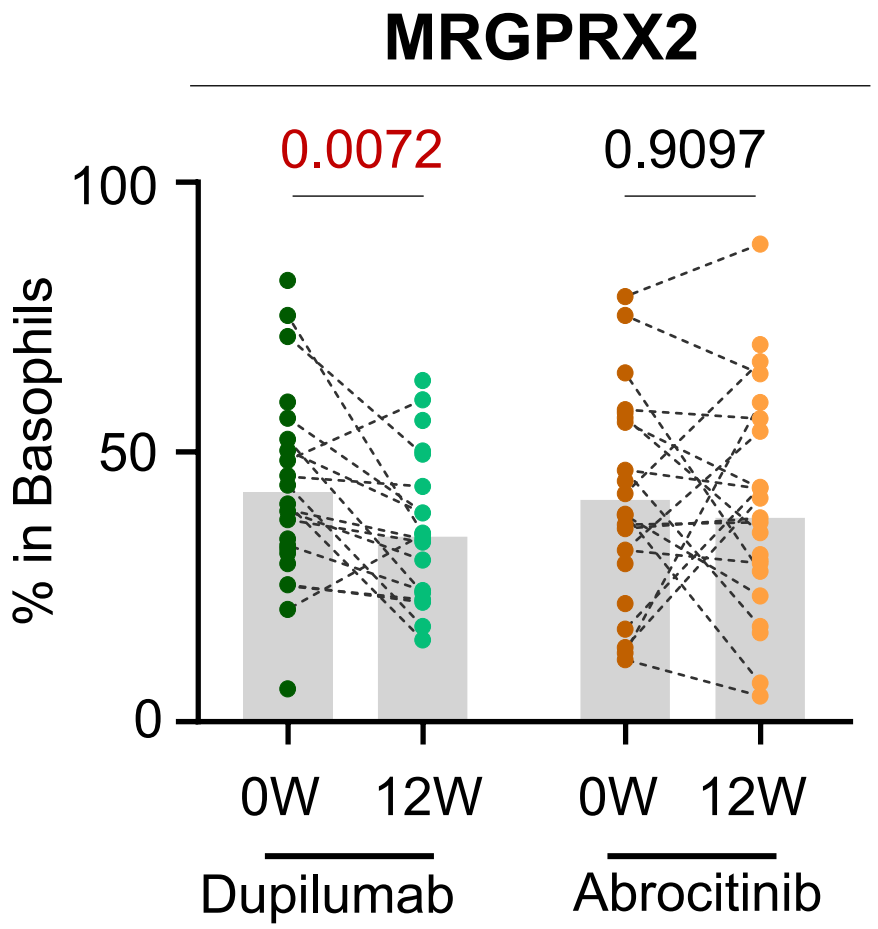
Dupilumab suppresses the non-IgE-mediated pathway





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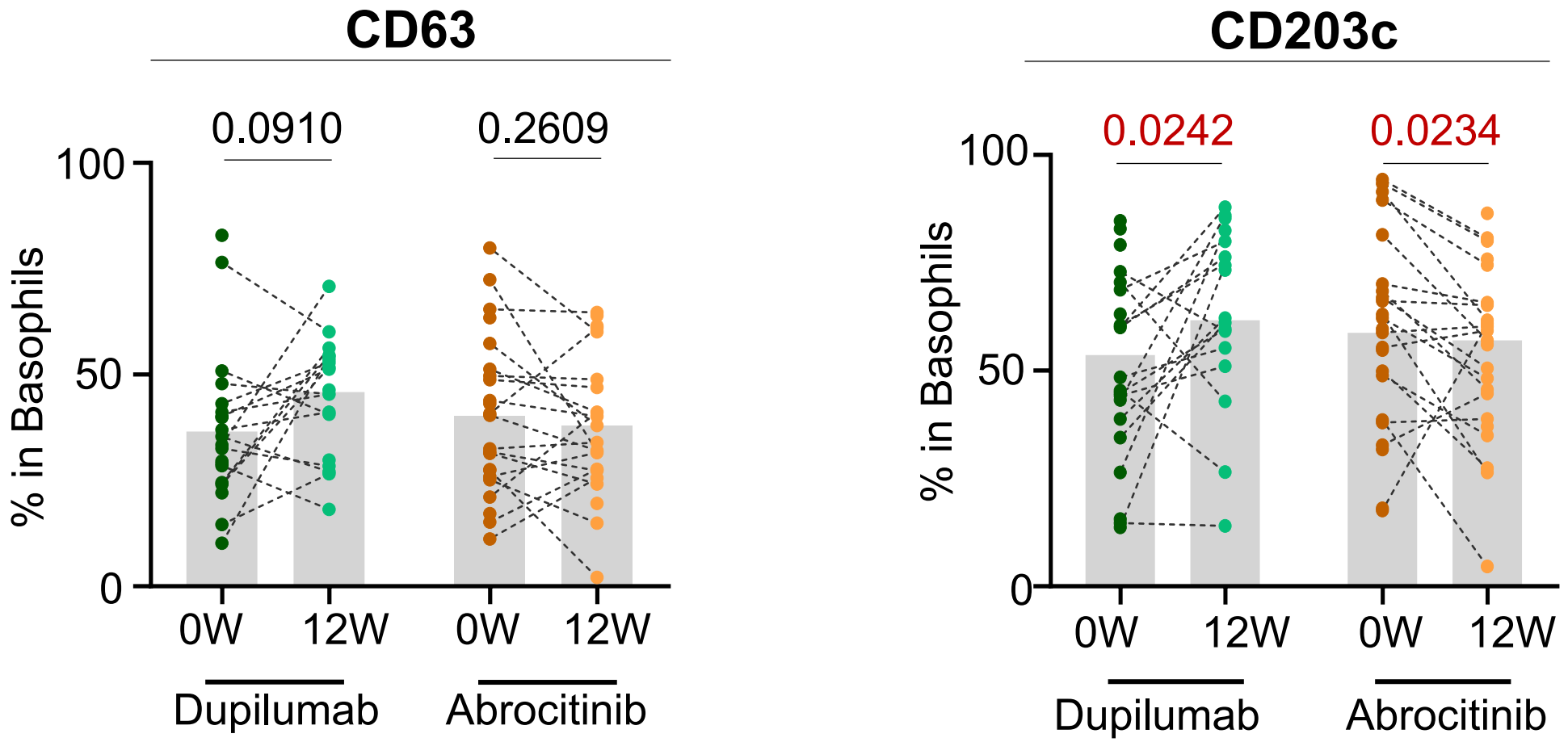
Dupilumab and abrocitinib exert distinct effects on basophil activation



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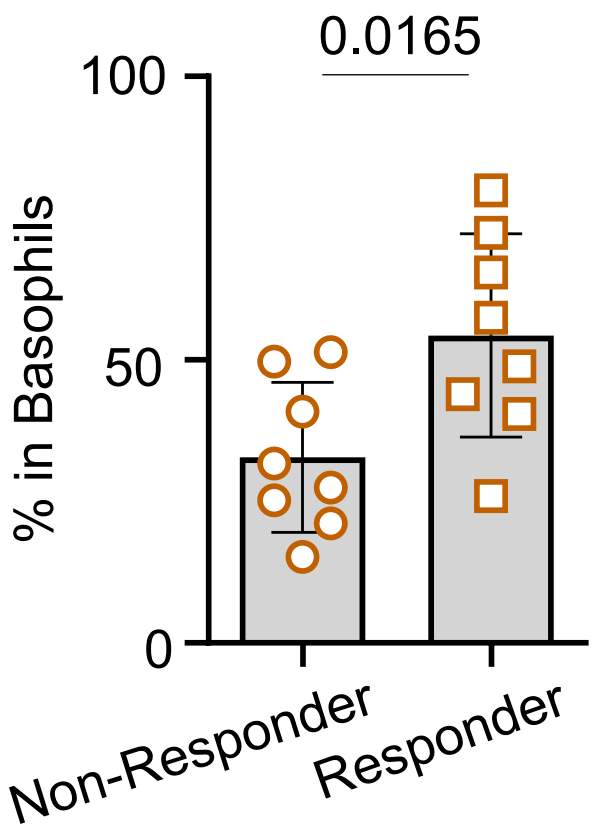
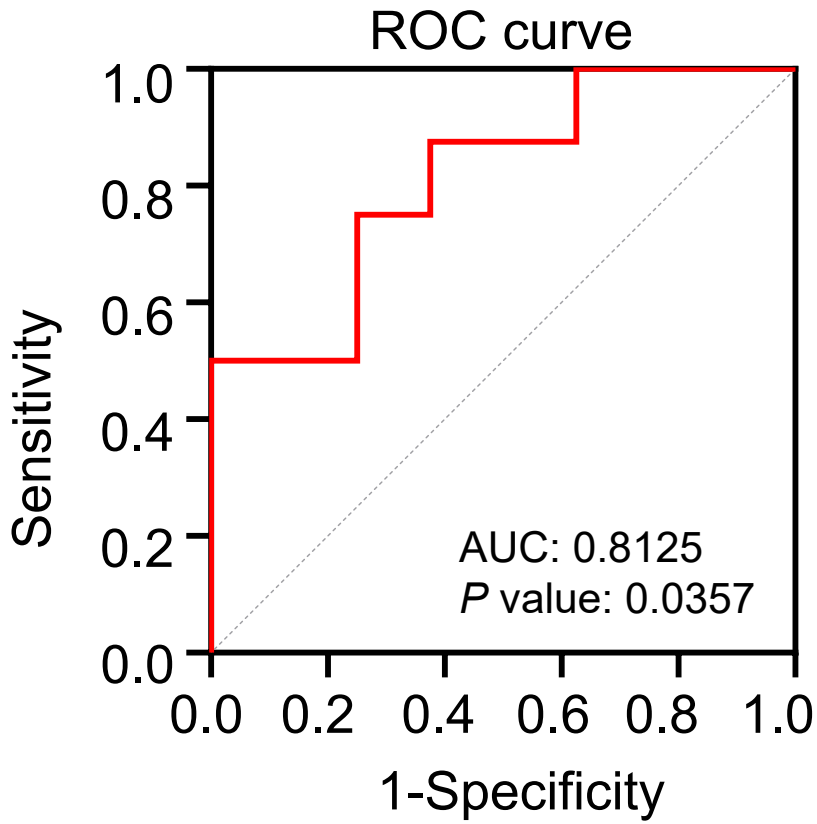
Baseline CD63 predicts clinical response to abrocitinib

CD63 in Abrocitinib Group





Responder: Patients reached EASI-75 after a 12-week treatment

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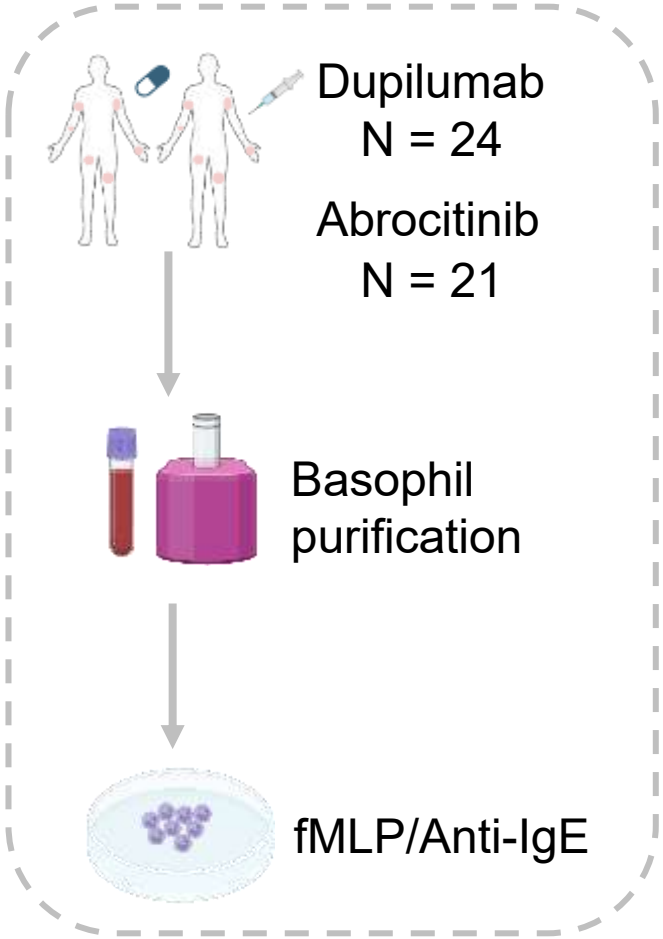
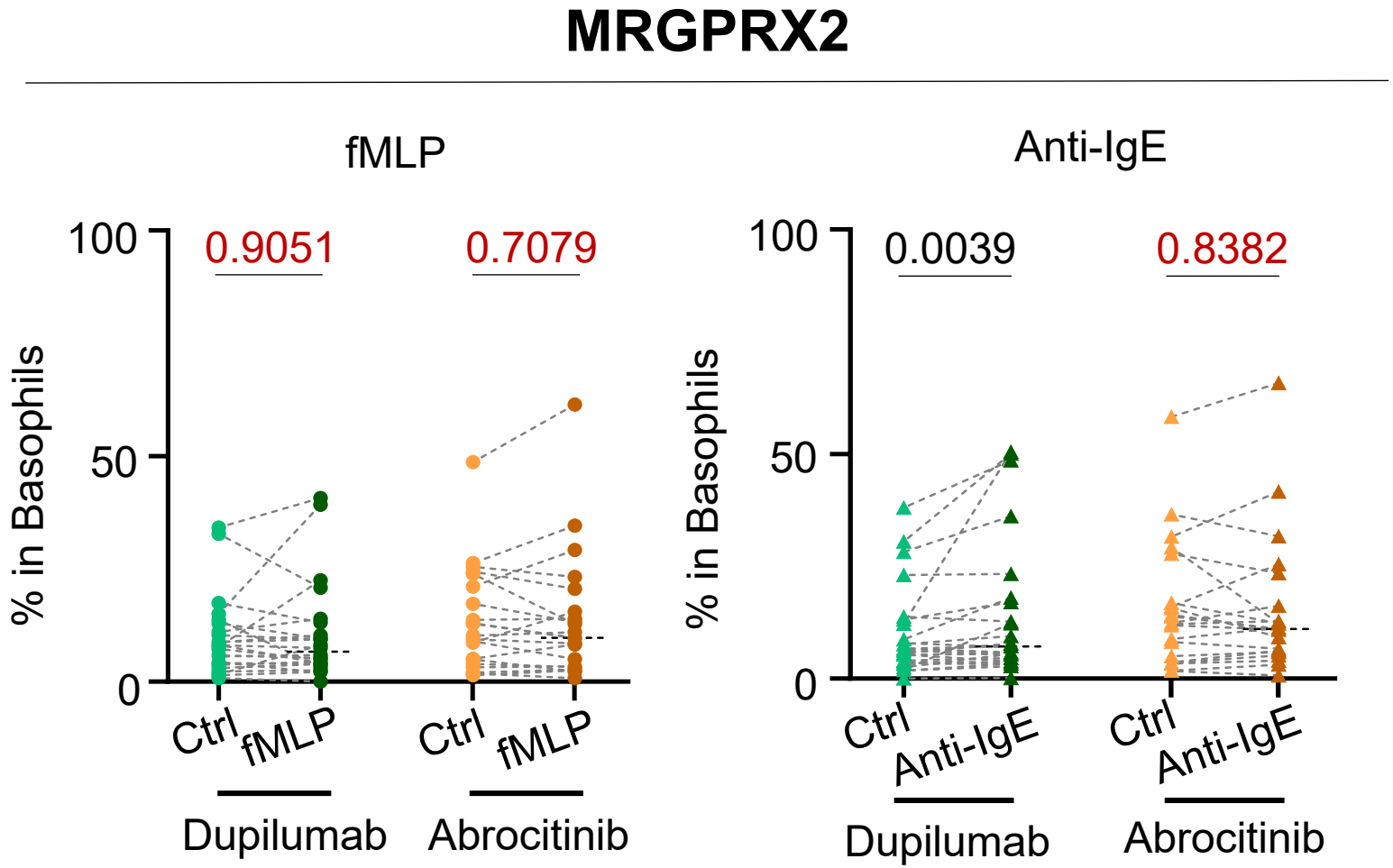
Differential effects of targeted therapies on MRGPRX2





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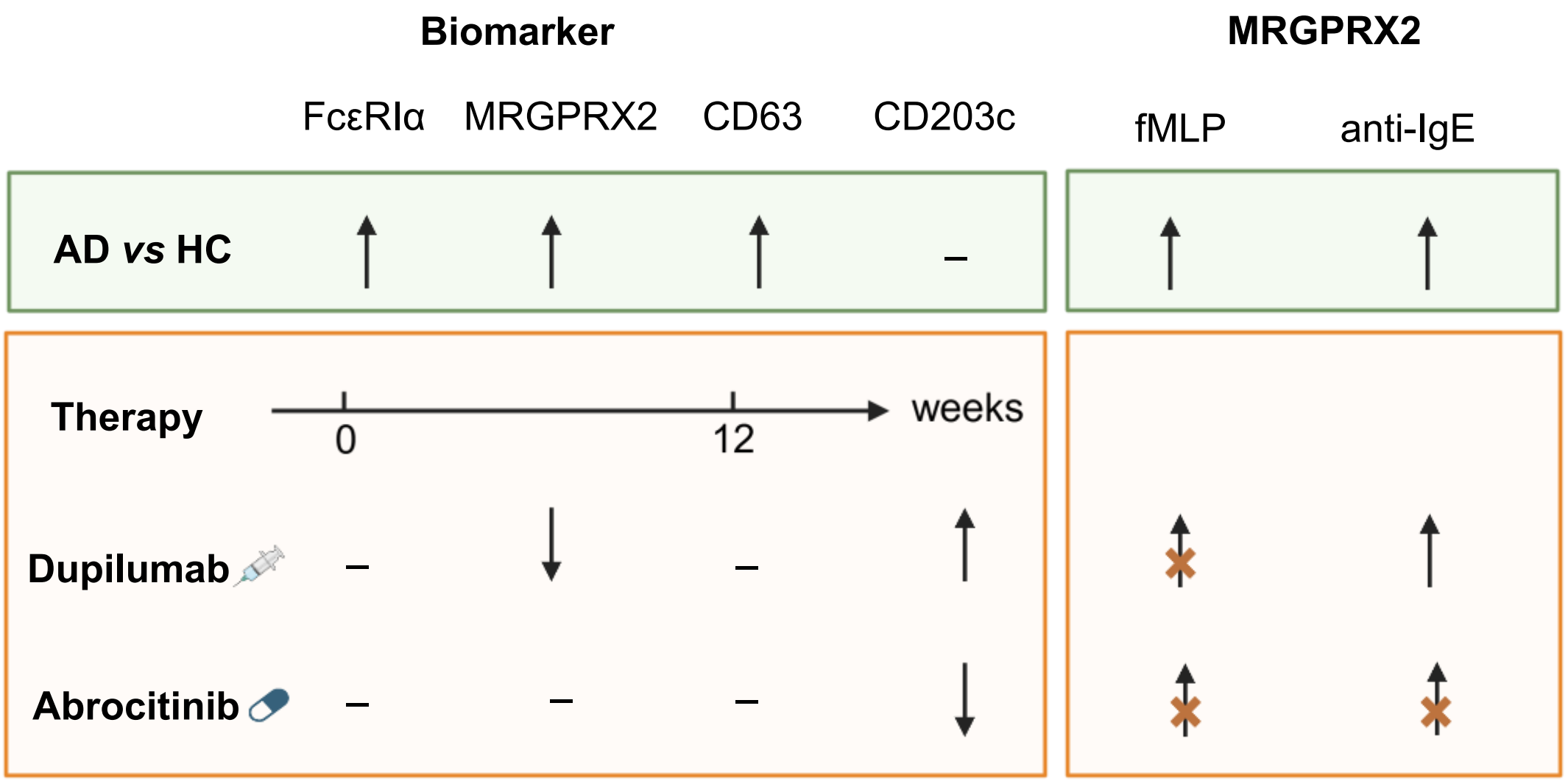
Summary


Biomarker
MRGPRX2
FcεRIα
MRGPRX2
CD63
CD203c
fMLP
anti-IgE
AD vs HC
–
Therapy
0
12
weeks
Dupilumab
–
–
Abrocitinib
–
–
–

Acknowledgements

Sun Yat-Sen University

Southern Medical School

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