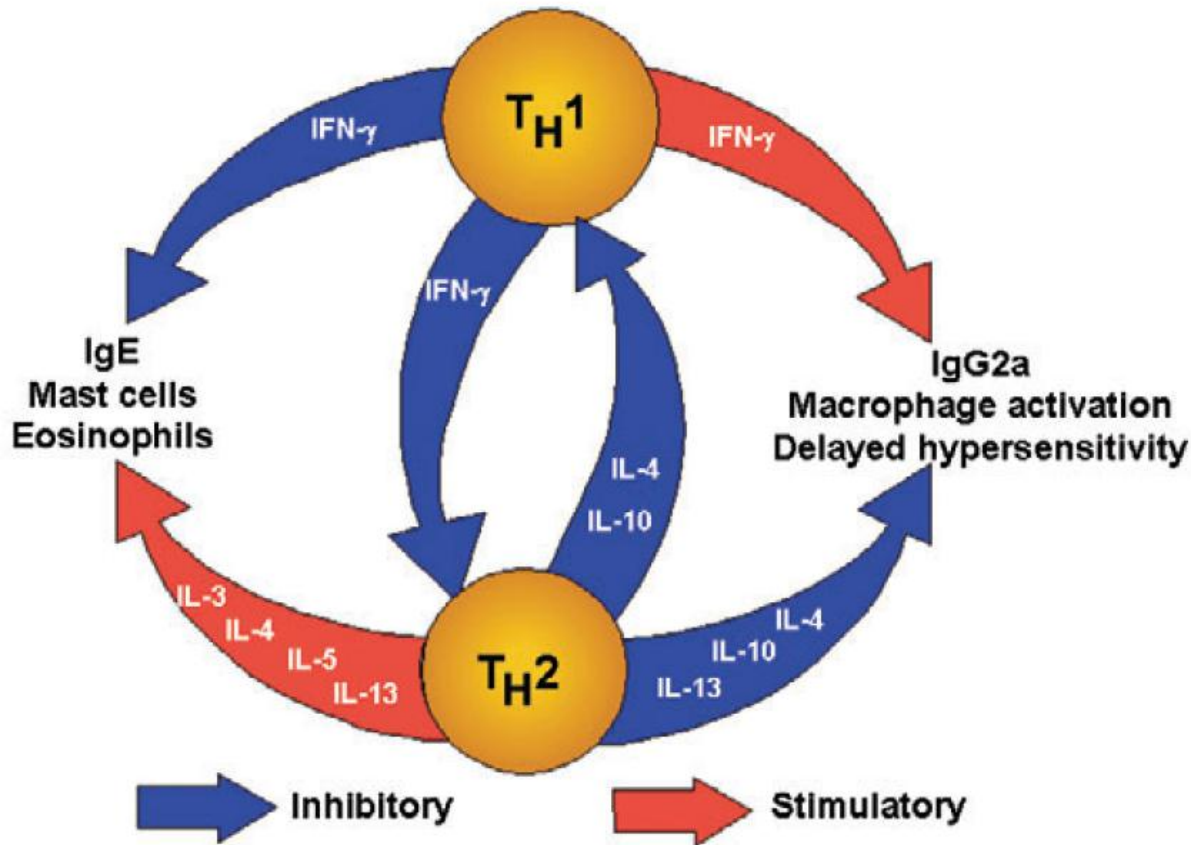


# Are all Th2 inflammations the same?

Douglas S Robinson

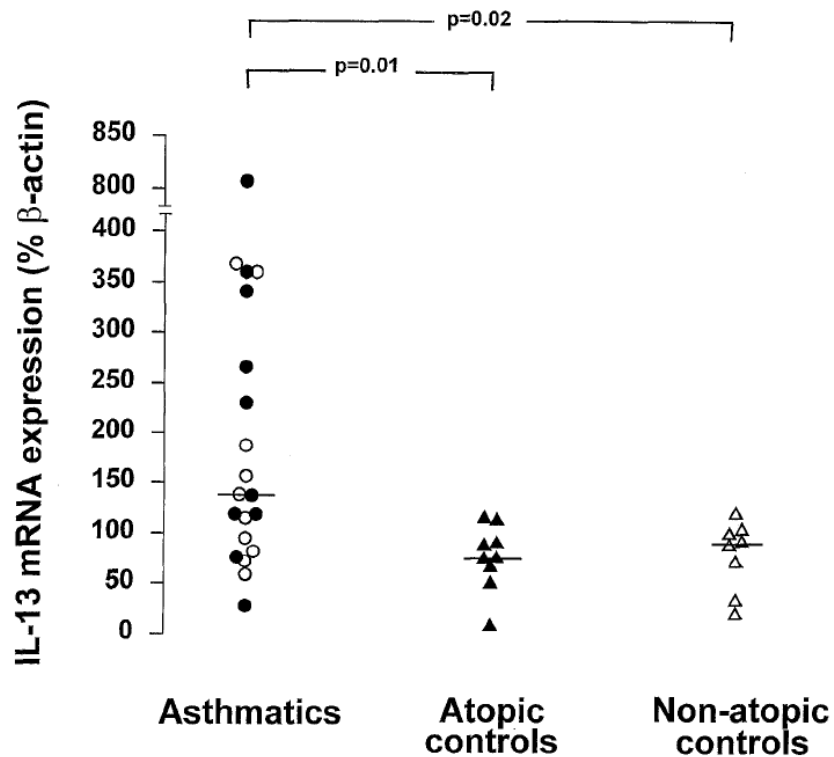
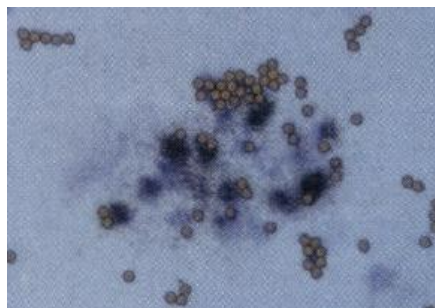
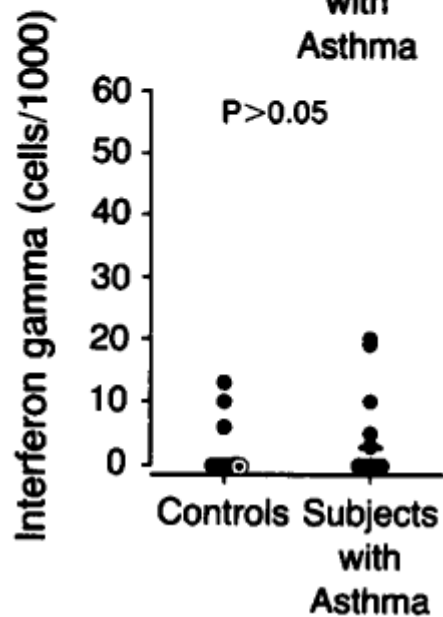
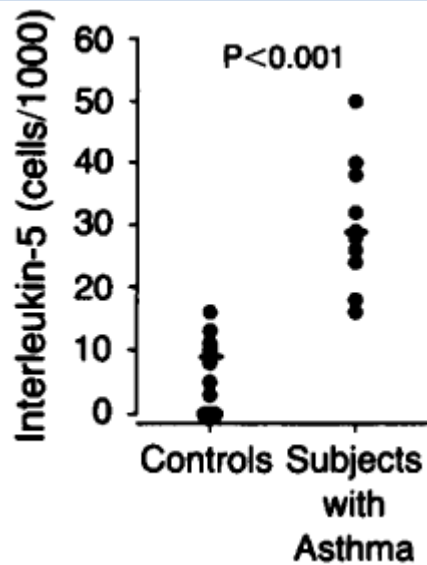
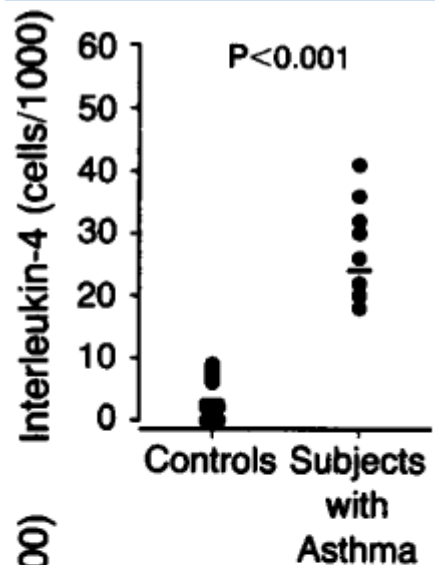
University College London Hospital,  
UK

# Th1 and Th2

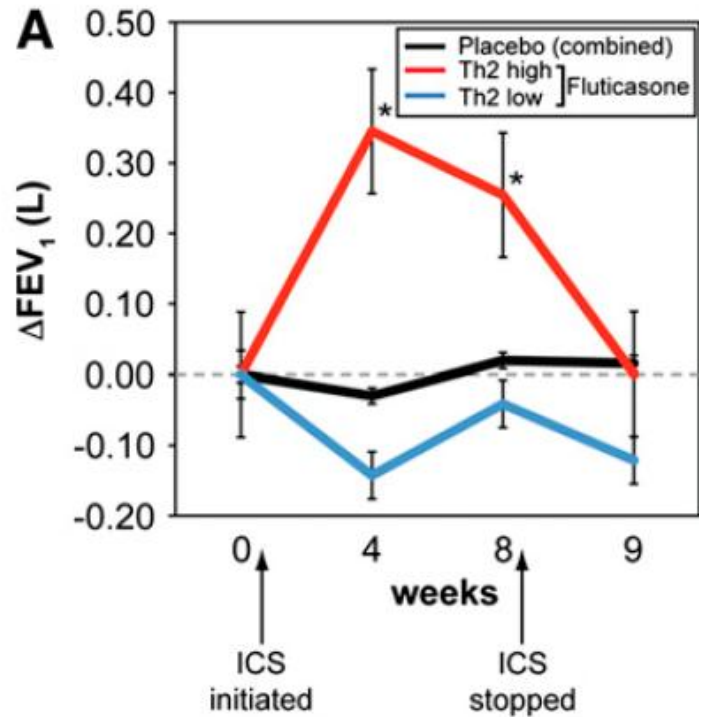
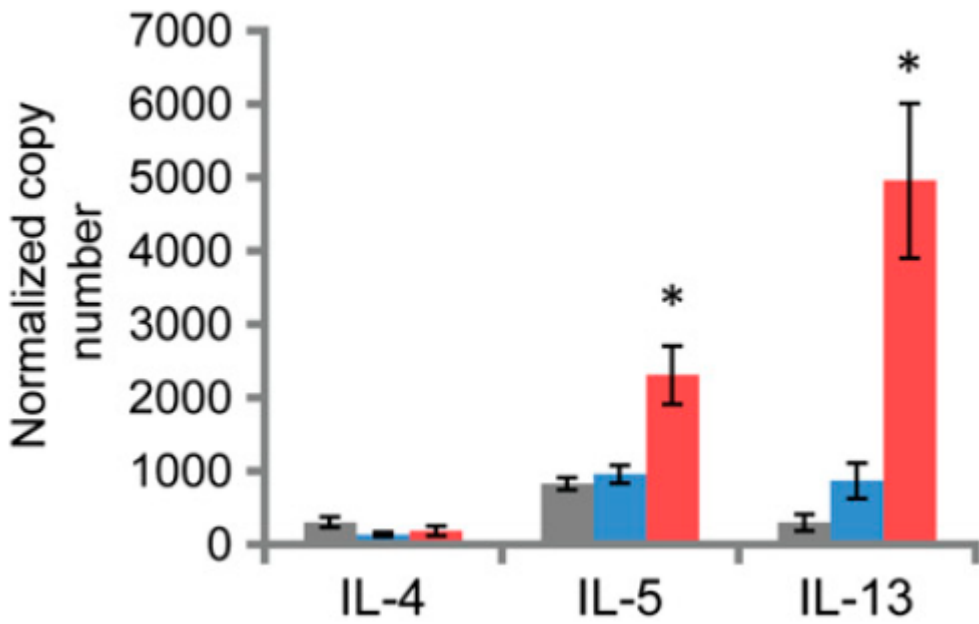
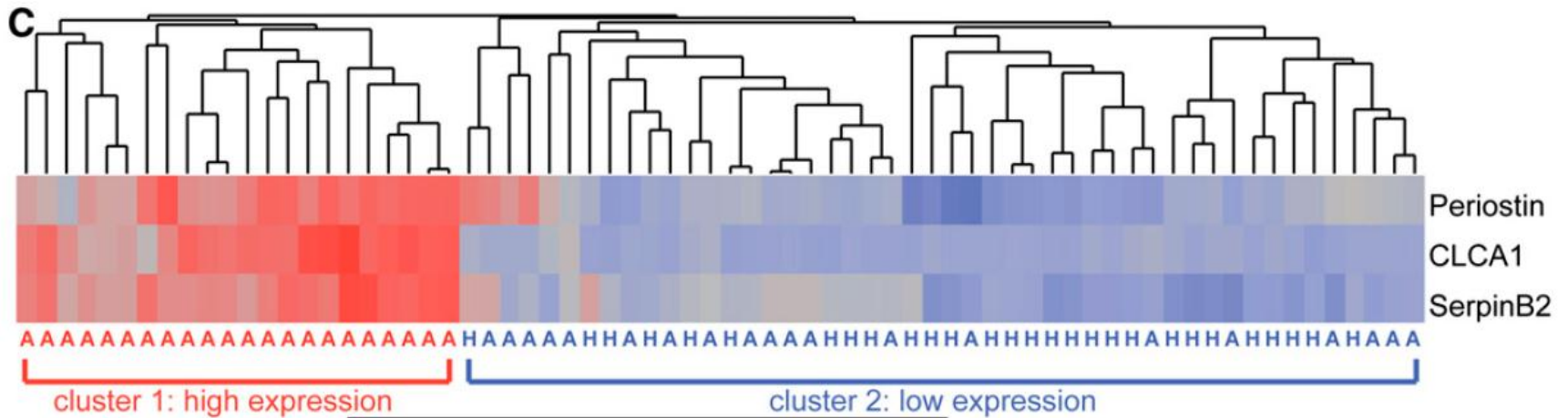


**PREDOMINANT T<sub>H2</sub>-LIKE BRONCHOALVEOLAR T-LYMPHOCYTE POPULATION IN ATOPIC ASTHMA**

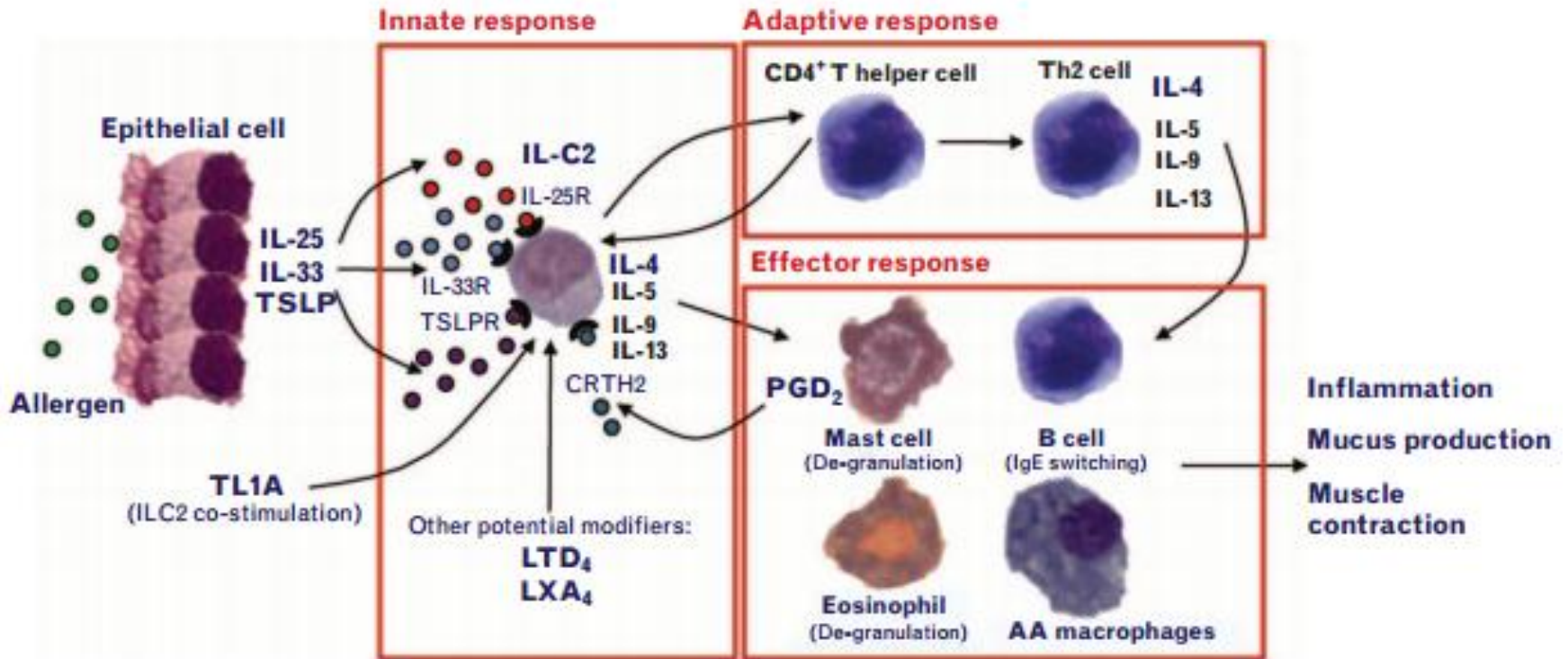
DOUGLAS S. ROBINSON, M.R.C.P., QUTAYBA HAMID, PH.D., SUN YING, M.D., ANNE TSICOPOULOS, M.D.,  
 JULIA BARKANS, ANDREW M. BENTLEY, M.R.C.P., CHRISTOPHER CORRIGAN, PH.D.,  
 STEPHEN R. DURHAM, M.D., AND A. BARRY KAY, PH.D.



# Variable Th2 gene expression in asthma

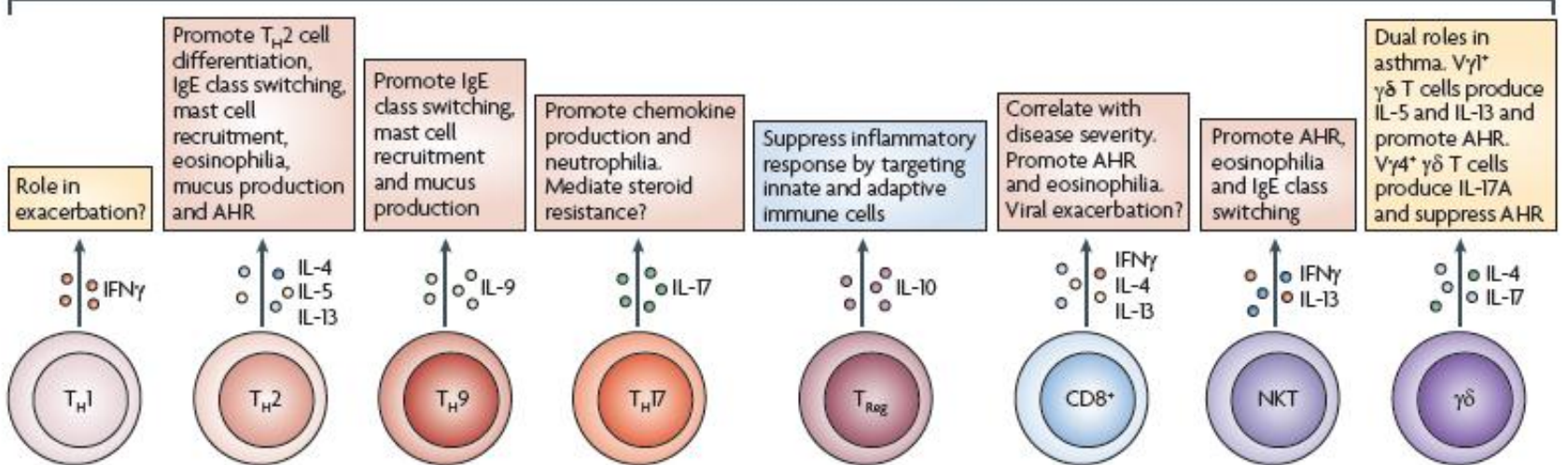
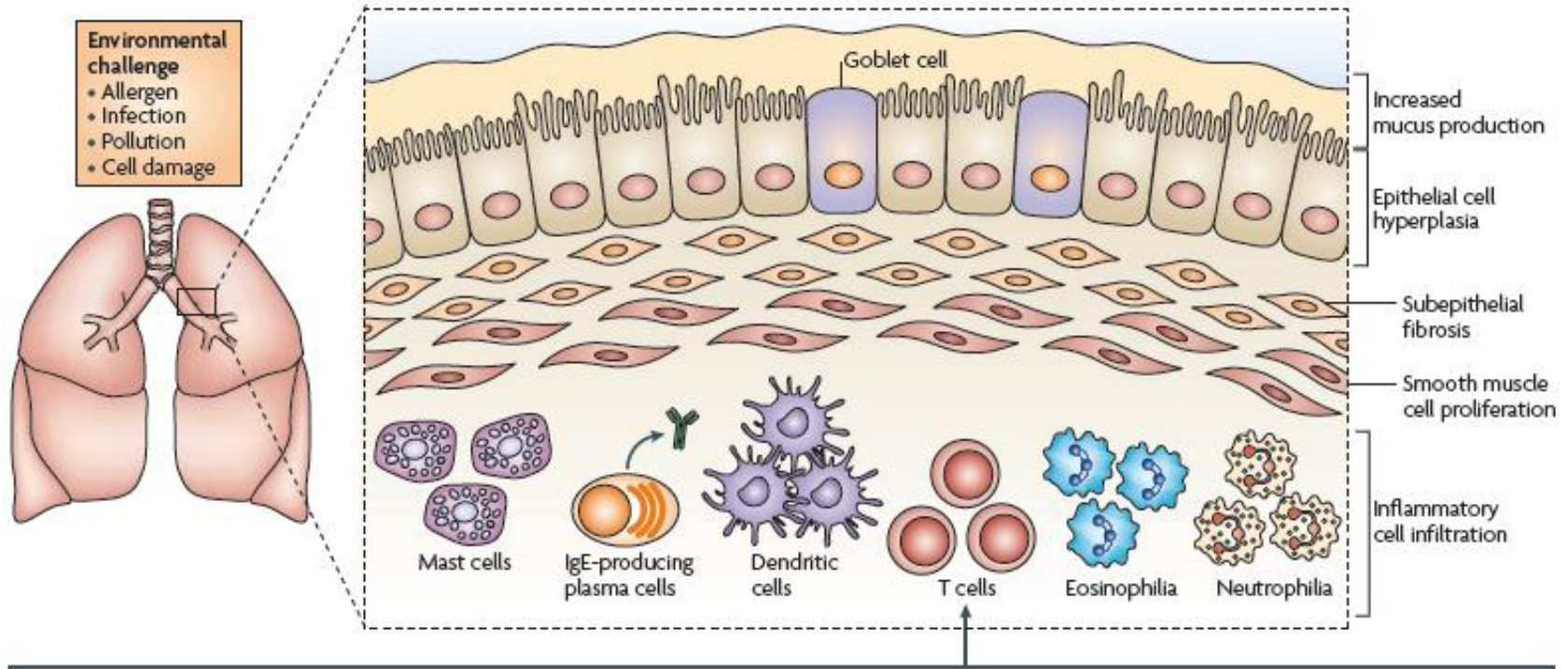


# ILC2 cells

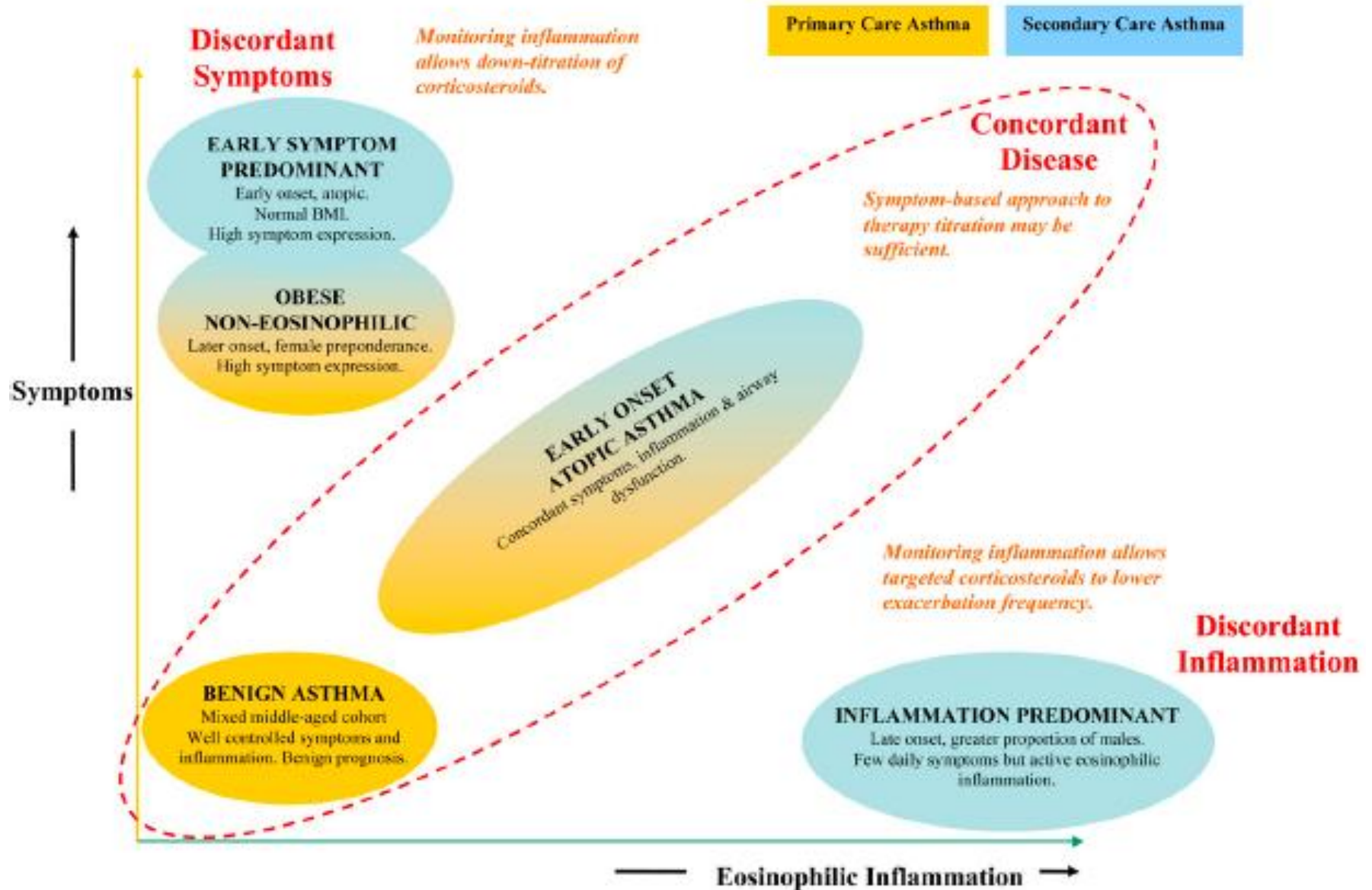


# Endotypes of asthma?

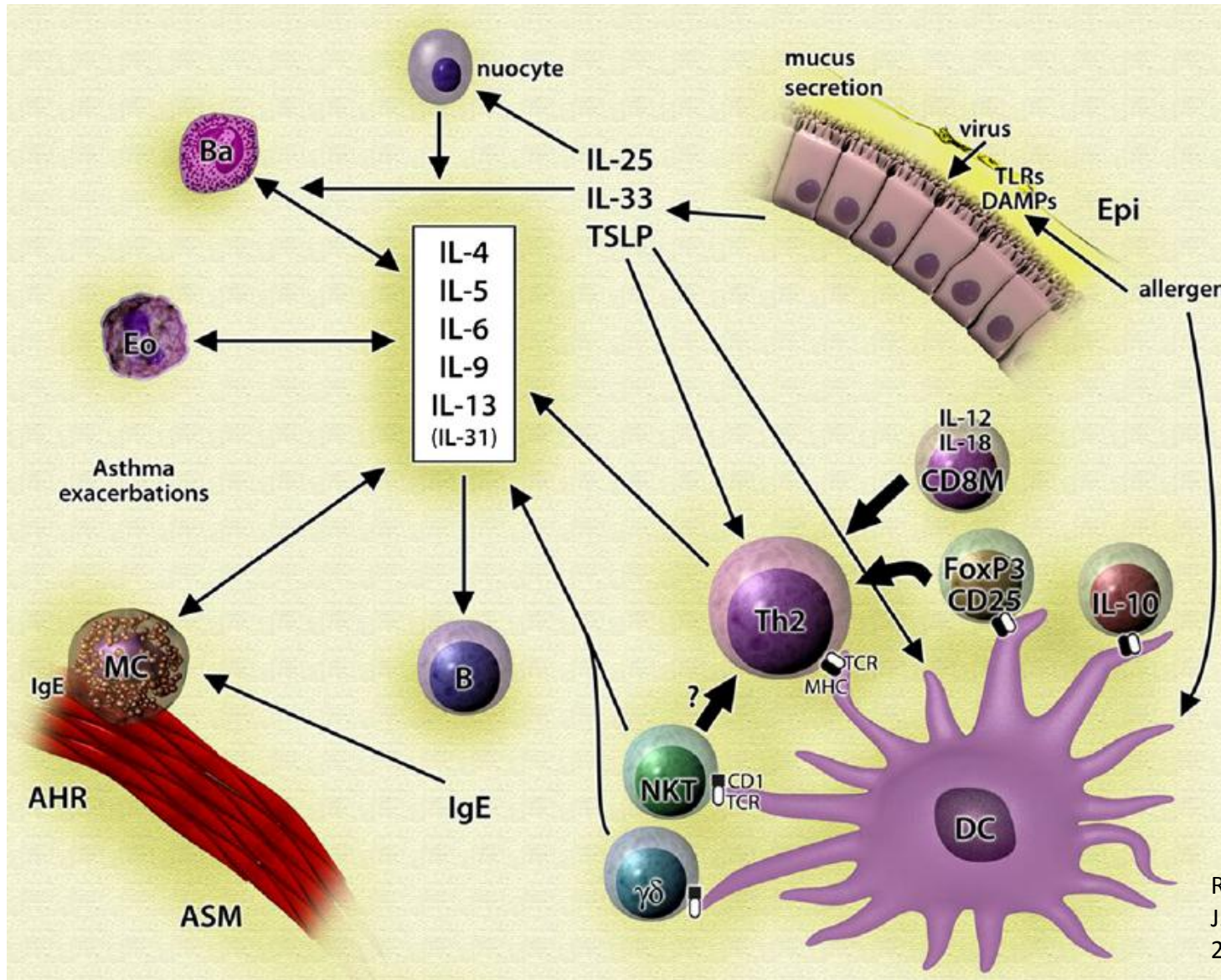
Lloyd and Hessel Nat Rev Immunol 2010



# Subtypes of asthma



# Asthma: from immunopathology to treatment

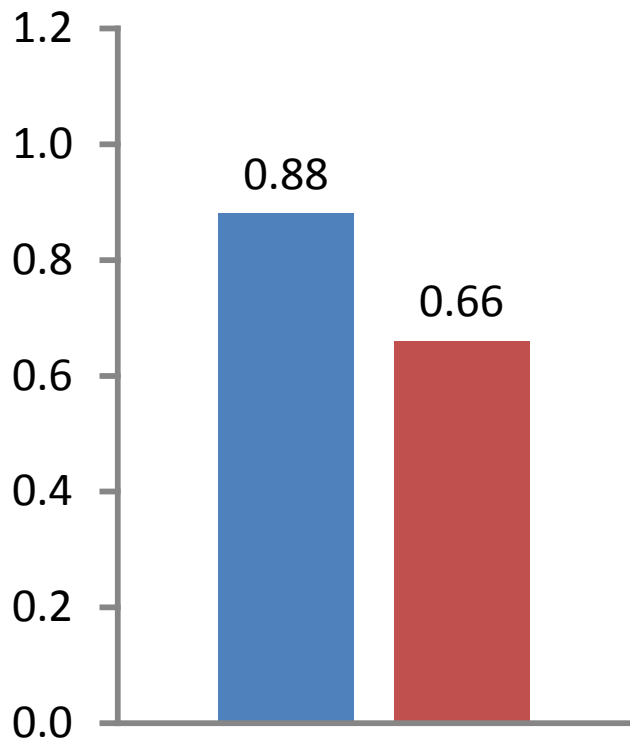


Robinson DS  
J.Allergy Clin.Immunol  
2010;126:1081-91

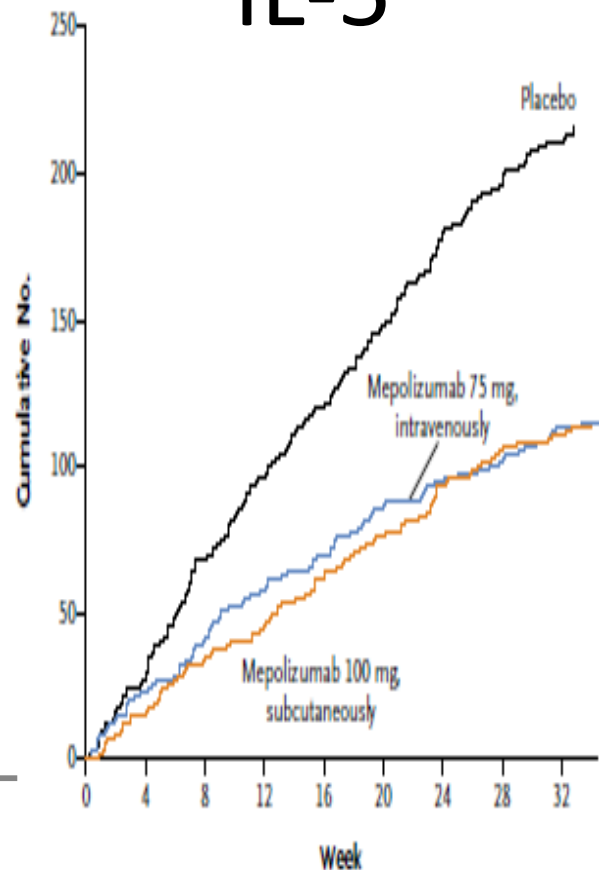


# Type 2 directed biologics in asthma

## IgE

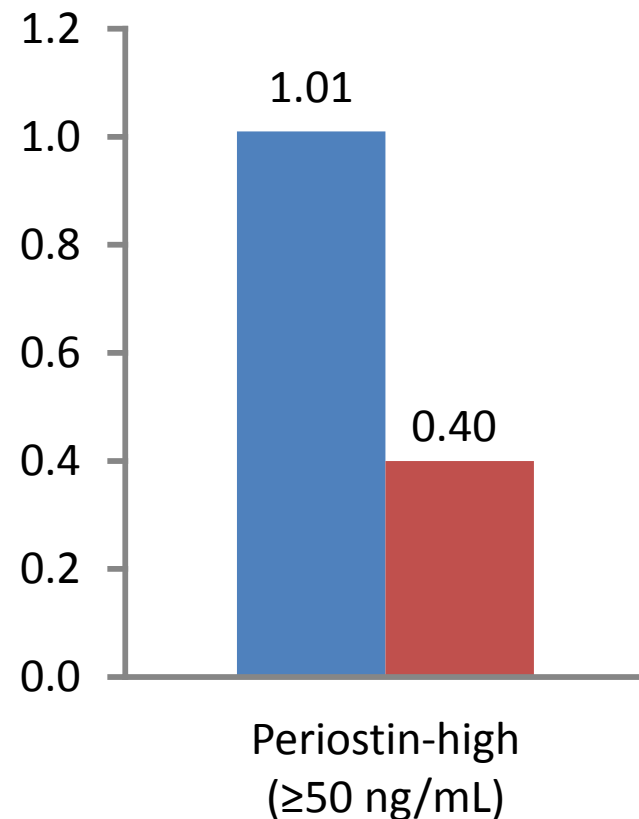


## Asthma Exacerbations



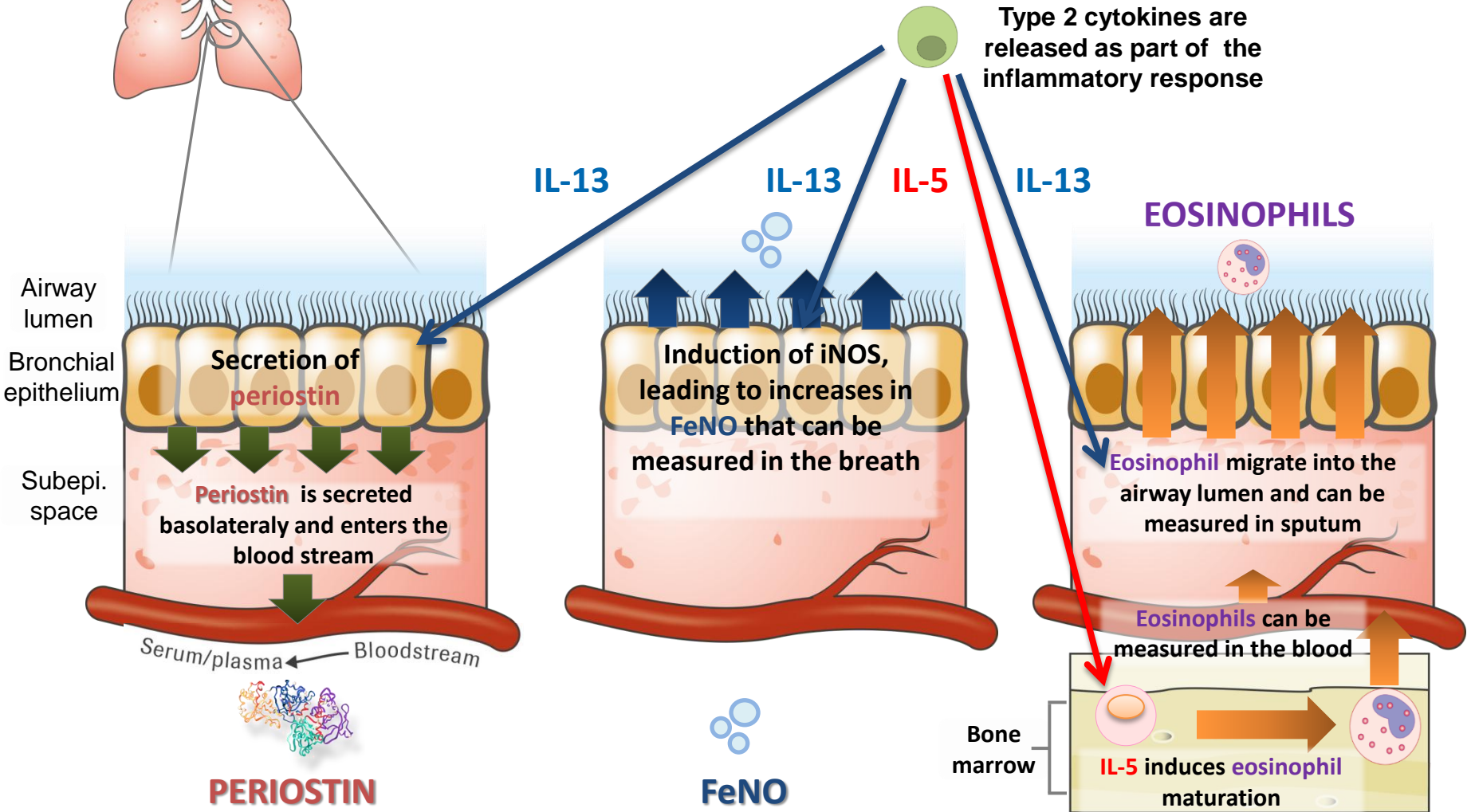
## IL-5

## IL-13



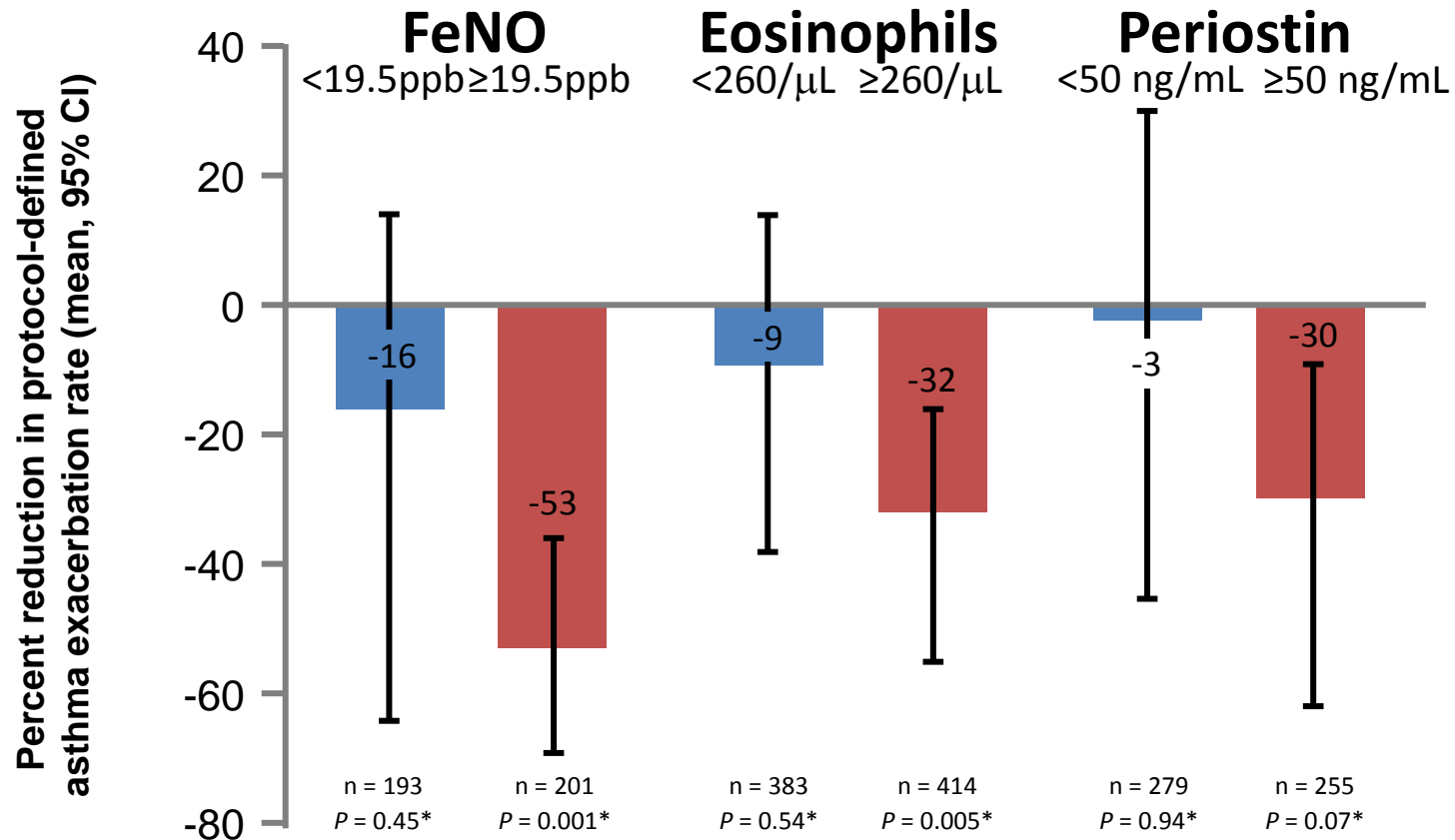
Hanania et al 2013 AmJRCCM  
Ortega et al NEJM 2014  
Corren et al NEJM 2011

# Biomarkers within Type 2 asthma



1. Sidhu SS, et al. *Proc Natl Acad Sci USA* 2010; 107:14170–5;
2. Suresh V, et al. *Am J Respir Cell Mol Biol* 2007; 37:97–104;
3. Menzies-Gow A, et al. *J Allergy Clin Immunol* 2003; 111:714–719;
4. Hershey G. *J Allergy Clin Immunol* 2003; 111:677-690

# Exacerbation reduction by biomarker



Exacerbations Rates						
	Low FeNO at baseline	High FeNO at baseline	Low eosinophils at baseline	High eosinophils at baseline	Low periostin at baseline	High periostin at baseline
Omalizumab	0.60	0.50	0.65	0.70	0.73	0.66
Placebo	0.71	1.07	0.72	1.03	0.72	0.93

Hanania NA, et al. *Am J Respir Crit Care Med* 2013;187:804-811

# Questions (and opinions!)

- Is all Type 2 asthma the same: are there subgroups with allergic (IgE) disease, eosinophil predominant (IL-5) or IL-13 driven?
  - Possibly, but likely overlap
- Is Type 2 allergic inflammation the same in different sites (lung, nose, skin)
  - Similarities but tissue specific differences (microbiome)
- How much allergic inflammation in non-Type 2?
  - Probably less than we think!

# Acknowledgements

- Barry Kay
- Stephen Durham
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- Andrew Menzies-Gow
- Marc Humbert
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