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2015Seminar: Update on Neutrophils in Asthma and Allergic Disease

The goal of this session is to have a vigorous discussion of the role(s) that neutrophils play, or may play, in asthma and other allergic diseases. We have proposed five questions (and approximate time allotments) to guide the discussion. The moderators will use their own findings and/or recent findings in the literature to initiate the discussion of each question. Session participants will be strongly encouraged to do the same in order to have an active and meaningful dialogue.

1. Introduction/overview (10 min)
   a. Neutrophils in asthma
      i. Phenotypes [neutrophilic, severe, steroid-resistant]
      ii. Exacerbations [acute, viral URI]
   b. Neutrophils in other allergic diseases [atopic dermatitis]
   c. Murine models of ‘asthma’ [OVA, HDM, RSV, SeV]

2. Question – What drives neutrophil recruitment to the airway? (10 min)
   a. Viral exacerbation
      i. HRV [ICAM-1, VCAM-1, IL8]
      ii. RSV [?CD49d, ?CysLTR1]
   b. Severe asthma [IL-17]
   c. Alarmins [HMGB1, IL-1α, SAA]

3. Question – How does airway environment impact neutrophil function? (10 min)
   a. IL-33
   b. GM-CSF [Survival, HLA-DR expression, histamine receptor expression]

4. Question – How do neutrophils contribute to airway pathophysiology? (20 min)
   a. Proteases [elastase, MMP9] and reactive oxygen species
   b. Eosinophil-neutrophil cross-activation
   c. FcεRI-mediated activation?
   d. Neutrophil extracellular traps?

5. Question – Do neutrophils have relevant immunoregulatory functions? (5 min)
   a. Influence on B and T cells, dendritic cells, and iNKTs

6. Question – Will delineating the role(s) for neutrophils in asthma impact the treatment guidelines for asthma? (5 min)