Characterization of type 2 immunity against enteropathogenic bacteria

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Abstract text

Text: Food allergy prevalence has substantially increased over the past few decades, affecting millions of people in industrialized countries. Recent research shows gastrointestinal (GI) infection can aggravate food allergies. Enteropathogenic *Escherichia coli* (EPEC) is one of the most common bacterial pathogens and can cause severe GI disease. Experimental studies show that infection with *Citrobacter rodentium* (CR), a murine enteropathogen related to EPEC, can drive allergic sensitization. However, the molecular mechanisms that fuel GI antibacterial type 2 immunity and contribute to allergy development are still unclear.
In this project, we aim to characterize the adaptive immune response to gastrointestinal bacterial infection and identify molecular factors that drive type 2 immunity and allergic sensitization.
We inoculated wild-type mice with CR and performed kinetic immunophenotyping of colon, caecum and draining lymph nodes to better understand the immunological and pathological mechanism. As such, we investigated immune cell composition by flow cytometry, immunopathology by histological analysis as well as inflammatory parameters by qPCR and cytokine multiplex assays throughout the course of CR infection. In addition, we used ELISA to chart antibacterial antibody responses in serum and feces.
We observed that CR infection modulated the numbers of goblet cells and other structural cells in the cecum and colon. Additionally, infected mice developed significantly increased total IgE and CR-specific IgG and IgA antibodies. Furthermore, the CR infection was associated with increased type 2 immunity-associated cytokines and immune cells in cecum, colon and lymph nodes.
In conclusion, our preliminary findings confirm that gastrointestinal CR infection triggers a type 2 immune response. We next aim to identify host immune mechanisms and the importance of potential CR virulence factors that contribute to antibacterial type 2 inflammation. We hope our investigations will help to fully understand the underlying mechanisms and long-term effects of this immune response on gut homeostasis and allergy development.

Conflict of Interest statement

Do you have any conflict of interest to declare?: No

Affirmation

1. Consent to participate and present onsite: Yes
2. Consent to publication publication: Yes
3. Consent on treatment of contact details saved in this system: Yes