The chemokine receptor CXCR5 is pivotal for ectopic mucosa-associated lymphoid tissue neogenesis in chronic Helicobacter pylori-induced inflammation.

Abstract:
Ectopic lymphoid follicles are a key feature of chronic inflammatory autoimmune and infectious diseases, such as rheumatoid arthritis, Sjögren's syndrome, and Helicobacter pylori-induced gastritis. Homeostatic chemokines are considered to be involved in the formation of such tertiary lymphoid tissue. High expression of CXCL13 and its receptor, CXCR5, has been associated with the formation of ectopic lymphoid follicles in chronic infectious diseases. Here, we defined the role of CXCR5 in the development of mucosal tertiary lymphoid tissue and gastric inflammation in a mouse model of chronic H. pylori infection. CXCR5-deficient mice failed to develop organized gastric lymphoid follicles despite similar bacterial colonization density as infected wild-type mice. CXCR5 deficiency altered Th17 responses but not Th1-type cellular immune responses to H. pylori infection. Furthermore, CXCR5-deficient mice exhibited lower H. pylori-specific serum IgG and IgA levels and an overall decrease in chronic gastric immune responses. In conclusion, the development of mucosal tertiary ectopic follicles during chronic H. pylori infection is strongly dependent on the CXCL13/CXCR5 signaling axis, and lack of de novo lymphoid tissue formation attenuates chronic immune responses.