Dendritic cell-independent B cell activation during acute virus infection: a role for early CCR7-driven B-T helper cell collaboration

Elke Scandella, Katja Fink, Tobias Junt, Beatrice M Senn, Evelyn Lattmann, Reinhold Förster, Hans Hengartner & Burkhard Ludewig

This study provides a detailed spatiotemporal interaction analysis between B cells, Th cells, and dendritic cells (DC) during the generation of protective antiviral B cell immunity. Following vesicular stomatitis virus (VSV) infection, conditional ablation of CD11c-positive DC at the time-point of infection did not impair extrafollicular plasma cell generation and Ig class switching. In contrast, the generation of Th and B cell responses following immunization with recombinant VSV-glycoprotein was DC-dependent. Furthermore, we show that the CCR7-dependent interplay of the three cell-types is crucial for virus-neutralizing B cell responses in the presence of limiting amounts of Ag. An immediate event following VSV infection was the CCR7-mediated interaction of VSV-specific B and Th cells at the T cell-B cell zone border that facilitated plasma cell differentiation and Th cell activation. Taken together, these experiments provide evidence for a direct, CCR7-orchestrated and largely DC-independent mutual activation of Th cells and Ag-specific B cells that is most likely a critical step during early immune responses against cytopathic viruses.