

# **Tuning B cell responses to antigens by cell polarity and membrane trafficking**

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## **Abstract**

The capacity of B lymphocytes to produce specific antibodies, particularly broadly neutralizing antibodies that provide immunity to viral pathogens has positioned them as valuable therapeutic targets for immunomodulation. To become competent as antibody secreting cells, B cells undergo a series of activation steps, which are triggered by the recognition of antigens frequently displayed on the surface of other presenting cells. Such antigens elicit the formation of an immune synapse (IS), where local cytoskeleton rearrangements coupled to mechanical forces and membrane trafficking orchestrate the extraction and processing of antigens in B cells. In this review, we discuss the molecular mechanisms that regulate polarized membrane trafficking and mechanical properties of the immune synapse, as well as the potential extracellular cues from the environment, which may impact the ability of B cells to sense and acquire antigens at the immune synapse. An integrated view of the diverse cellular mechanisms that shape the immune synapse will provide a better understanding on how B cells are efficiently activated.

## **Keywords**

Actin cytoskeleton; Antigen extraction and presentation; B-lymphocytes; Cell polarity; Endocytosis; Lysosome trafficking