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Essential role for autophagy in the maintenance of immunological memory against Influenza infection

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Vaccination has been the most widely used strategy to protect against viral infections for centuries. However, the molecular mechanisms governing the long-term persistence of immunological memory in response to vaccines remain unclear. We have observed that autophagy plays a critical role in the maintenance of memory B cells against influenza virus infection. Memory B cells displayed elevated levels of basal autophagy with increased expression of genes that regulate autophagy initiation or autophagosome maturation. Mice with B cell-specific deletion of Atg7 (B/Atg7–/–) showed normal primary antibody responses after immunization against influenza, but failed to generate protective secondary antibody responses when challenged with influenza viruses, resulting in high viral loads, widespread lung destruction and increased fatality. Our results suggest that autophagy is essential for the survival of virus-specific memory B cells and the maintenance of protective antibody responses required to combat infections (Nature Medicine, in press).

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