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Chemokines, B1 cell homing and body cavity immunity

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B1 cells are a predominant cell type in body cavities and an important source of natural antibody. However, the mechanism of B cell homing to the body cavities has not been defined. We report that in mice lacking the chemokine, CXCL13, B cells are deficient in peritoneal and pleural cavities but not in spleen. CXCL13 is produced by cells in the omentum and by peritoneal macrophages, and in adoptive transfers, B1 cells home to the omentum and the peritoneal and pleural cavities in a CXCL13-dependent manner. By whole mount fluorescence microscopy, intravenously transferred B cells are observed to migrate from the blood into lymphoid aggregates or 'milky spots' in the omentum. In addition to promoting homing of circulating B1 cells to the body cavities, CXCL13 may function to promote local retention of this self-replenishing B cell population. CXCL13-/- mice are found to be deficient in pre-existing phosphorylcholine (PC)-specific antibodies, and in their ability to mount an anti-PC response to peritoneal streptococcal antigen. These findings provide new insight into the mechanism of B1 cell homing and establish a critical role for B1 cell compartmentalization in production of natural antibodies and for body cavity immunity.

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