



## Innate immunity activators

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The growth factor GM-CSF is a pleiotropic cytokine with activatory properties for innate leukocytes and is believed to be produced mostly by non-hematopoietic cells and macrophages. In *Science*, Rauch *et al.* show that phenotypically and functionally distinct B cells, called 'innate response–activator' (IRA) B cells, are the largest GM-CSF-producing population in models of sepsis and bacterial infection. IRA B cells develop from peritoneal B-1 cells that migrate to the spleen and differentiate after signaling via Toll-like receptor 4 and autocrine GM-CSF signaling. IRA B cells have a surface marker and transcriptional profile distinct from that of follicular, marginal-zone or transitional B cell subtypes and spontaneously secrete immunoglobulin M and IL-3 but do not produce IL-10, IL-6 or tumor-necrosis factor (TNF). Deletion of IRA B cell–specific activity impairs bacterial clearance, elicits a cytokine storm and precipitates septic shock.

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