IN BRIEF

NEUROIMMUNOLOGY

Dual roles for perivascular macrophages in immune-to-brain signaling

Serrats, J. *et al. Neuron* **65**, 94–106 (2010)

Cytokines, produced during infection and/or inflammation, are known to activate the hypothalamic–pituitary–adrenal (HPA) axis through the induction of prostanoid production by vascular cells. However, the identity of the vascular cell type(s) involved is not known. By depleting the brain-resident perivascular macrophages in rats through intracerebroventricular injection of liposome-encapsulated clodronate, this paper identifies a dual role for these cells in the central nervous system response to inflammatory insult. Perivascular macrophages are required for full HPA axis activation in response to systemic interleukin-1 (IL-1) challenge through the production of prostanoids. In addition, these cells inhibit endothelial cell production of prostanoids in response to systemic lipopolysaccharide (which, unlike IL-1, activates both perivascular macrophages and endothelial cells), and their depletion results in an enhancement of the later stages of the HPA and febrile responses. This indicates that perivascular macrophages have two contrasting roles in brain–immune crosstalk.

INNATE IMMUNITY

APOBEC3 proteins mediate the clearance of foreign DNA from human cells

Stenglein, M. D. *et al. Nature Struct. Mol. Biol.* 10 Jan 2010 (doi:10.1038/nsmb.1744)

Intracellular microbial DNA or self DNA from damaged cells is recognized by various types of receptor and triggers an inflammatory innate immune response involving type I interferon (IFN) production. This study indicates that the degradation of intracellular double-stranded DNA might be a conserved part of this innate immune defence mechanism. Expression of the DNA cytidine deaminase apolipoprotein B mRNA-editing enzyme, catalytic polypeptide-like 3A (APOBEC3A) can be induced by DNA detection and type I IFNs. The authors showed that in primary human phagocytes, APOBEC3A can mediate the clearance of foreign double-stranded DNA by converting cytidine residues in the DNA to uridine residues. The uracil DNA glycosylase UNG2 then excises uracil residues from the DNA to create nuclease-susceptible abasic sites. By contrast, endogenous genomic DNA seems to be resistant to APOBEC3A-dependent deamination through an unknown mechanism.

TUMOUR IMMUNOLOGY

Antigen specificity determines the pro- or antitumoral nature of $CD8^+$ T cells

Cuff, S. *et al. J. Immunol.* **184**, 607–614 (2010)

$CD8^+$ T cells are well known to have antitumoural activities, but recent studies indicate they can also be protumoural. Using a mouse model of pulmonary metastasis involving subcutaneous injection of B16 melanoma cells, Cuff ***et al.*** show that $CD8^+$ T cells promote the initial stages of pulmonary tumour establishment, in part, by inhibiting effective antitumour natural killer cell responses. The effect of $CD8^+$ T cells on the tumour depended on their antigen specificity: $CD8^+$ T cells specific for an influenza virus antigen expressed by the B16 tumour cells were antitumoural, but the same $CD8^+$ T cells promoted the growth of B16 tumours that did not express the viral antigen. The finding that prior infection with influenza virus to activate non-tumour-specific $CD8^+$ T cells increased the number of pulmonary tumours implicates previous infections as risk factors for metastatic cancer.

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