IN BRIEF

MUCOSAL IMMUNOLOGY

Induction of colonic regulatory T cells by indigenous *Clostridium* species

Atarashi, K. *et al. Science* 23 Dec 2010 (doi:10.1126/science.1198469)

There is currently much interest in the crosstalk between the gut microbiota and the immune system. This study shows that forkhead box P3 (FOXP3)$^+$ regulatory T (T_{Reg}) cells are most abundant in the colon and, through the use of germ-free or antibiotic-treated specific pathogen-free (SPF) mice, that accumulation of these cells after weaning depends on the gut microbiota. Further analysis identified *Clostridium* spp. belonging to clusters IV and XIV as the specific component of the microbiota that induces colonic T_{Reg} cell accumulation. A defined mix of *Clostridium* spp. induced the production of transforming growth factor-β by intestinal epithelial cells (in a TLR-, NOD- and dectin 1-independent manner) and the accumulation of IL-10$^+$CTLA4^{hi} T_{Reg} cells in the colon. Finally, oral inoculation of neonatal SPF mice with *Clostridium* spp. suppressed the development of DSS-induced colitis and systemic IgE responses.

DENDRITIC CELLS

Mucosal and systemic anti-HIV immunity controlled by A20 in mouse dendritic cells

Hong, B. *et al. J. Clin. Invest.* 4 Jan 2011 (doi:10.1172/JCI42656)

The ubiquitin-modifying enzyme A20 (also known as TNFAIP3) is a negative feedback regulator of several important pro-inflammatory signalling pathways and controls the immunostimulatory function of antigen-presenting cells. Silencing of *A20* mRNA may therefore affect the potency of dendritic cells (DCs) in the induction of HIV-specific immune responses. Injection of mice with *A20*-silenced, bone-marrow-derived DCs loaded with recombinant HIV envelope protein gp120 resulted in cellular and humoral gp120-specific immune responses, both in mucosal tissues and systemically. These DCs migrated more efficiently to the mesenteric lymph nodes than control DCs and induced the expression of gut-homing receptors on activated lymphocytes, partly through the production of retinoic acid. Furthermore, *A20*-silenced gp120-pulsed DCs enhanced cytotoxic T cell responses in the absence of CD4$^+$ T cells. So, silencing of *A20* may enhance the efficacy of DC-based vaccines against HIV.

TUMOUR IMMUNOLOGY

CD169-positive macrophages dominate antitumor immunity by crosspresenting dead cell-associated antigens

Asano, K. *et al. Immunity* 30 Dec 2010 (doi:10.1016/j.immuni.2010.12.011)

It is not known how antigen-presenting cells in the lymph node internalize and cross-present tumour-associated antigens to CD8$^+$ T cells for the initiation of effective antitumour cytotoxic T lymphocyte (CTL) responses. In agreement with previous observations, subcutaneous injection of dead tumour cells activated tumour-specific CTLs. However, this did not induce the migration of CD11c$^+$ DCs from the skin to the draining lymph node; instead, the dead cells travelled via lymphatic flow to the draining lymph node, where they were phagocytosed by CD169$^+$ macrophages in a phosphatidylserine-dependent manner. Antitumour responses did not develop when dead tumour cells were administered to tumour-bearing mice that lacked CD169$^+$ macrophages. Finally, CD11c$^+$CD169$^+$ macrophages (which mainly localized in the cortical and paracortical sinus) were shown to directly cross-present dead-cell-associated antigen to CD8$^+$ T cells. So, CD169$^+$ macrophages promote tumour immunity following tumour cell death.