IN BRIEF

MONOCYTES

The monocyte family tree

Monocytes and dendritic cells (DCs) originate from a common macrophage and DC progenitor (MDP) and classical and plasmacytoid DCs develop from an intermediate stage, the common DC progenitor (CDP). Now, Hettinger *et al.* identify a progenitor for monocytes and monocyte-derived macrophages downstream of the MDP, which they termed the common monocyte progenitor. Common monocyte progenitors had a lineage-negative $CD117^{+}CD115^{+}CD135^{-}LY6C^{+}CD11b^{-}$ phenotype and showed high proliferative and clonogenic activity. In mice, common monocyte progenitors gave rise to $LY6C^{hi}$ and $LY6C^{low}$ monocytes, and to macrophages following macrophage deletion or inflammation, but they did not give rise to DCs. These observations, together with the results of proteomic analyses, indicate that common monocyte progenitors are committed to monocyte differentiation but that they lack any monocyte functionality.

ORIGINAL RESEARCH PAPER Hettinger, J. *et al.* Origin of monocytes and macrophages in a committed progenitor. *Nature Immunol.* http://dx.doi.org/10.1038/ni.2638 (2013)

NK CELL RESPONSES

A dietary boost for NK cells

New findings show that natural killer (NK) cell activity is modulated by exogenous (including dietary) and endogenous ligands for the aryl hydrocarbon receptor (AHR). AHR was found to be mainly expressed by conventional splenic NK cells following cytokine stimulation. Despite having normal development and maturation, NK cells from AHR-deficient mice had poor cytotoxic activity compared with NK cells from wild-type mice. Indeed, NK cells in AHR-deficient mice failed to protect against the growth of RMA-S tumours. The administration of the endogenous AHR agonist FICZ (6-formylindolo[3,2-b]carbazole) to RMA-S tumour-bearing wild-type mice enhanced NK cell control of tumour growth but had no effect in AHR-deficient mice. NK cells from the FICZ-treated wild-type mice produced more interferon-γ and had a greater cytotoxic capacity than NK cells from untreated mice. The finding that various AHR ligands could also modulate human NK cells suggests new ways to activate NK cells in therapeutic settings.

ORIGINAL RESEARCH PAPER Ho Shin, J. *et al.* Modulation of natural killer cell antitumour activity by the aryl hydrocarbon receptor. *Proc. Natl Acad. Sci. USA* http://dx.doi.org/10.1073/pnas.1302856110 (2013)

MACROPHAGES

A role in early pregnancy

Care *et al.* report that macrophages have a central role in early pregnancy in mice. The deletion of $CD11b^{+}$ cells early after conception led to defective embryo implantation, whereas the administration of macrophages rescued this phenotype. For implantation to occur, the endometrium undergoes structural changes in response to progesterone. Progesterone is secreted by the corpora lutea, which develop from ovarian follicles following ovulation. Macrophage depletion disturbed the luteal microvasculature and lowered the levels of progesterone in the blood, whereas progesterone treatment restored the capacity for pregnancy in $CD11b^{+}$ cell-depleted mice. These and other findings suggest that the pro-angiogenic and, possibly, the anti-inflammatory functions of macrophages sustain the development and the function of the corpora lutea in early pregnancy.

ORIGINAL RESEARCH PAPER Care, A. S. *et al.* Macrophages regulate corpus luteum development during embryo implantation in mice. *J. Clin. Invest.* http://dx.doi.org/10.1172/JCI60561 (2013)