IN BRIEF

AUTOIMMUNITY

Immunoregulatory mechanisms triggered by viral infections protect from type 1 diabetes in mice

Filippi, C. M. *et al. J. Clin. Invest.* **119**, 1515–1523 (2009)

The role of viral infection in promoting or preventing type 1 diabetes is a controversial topic. In non-obese diabetic (NOD) mice, which spontaneously develop autoimmune diabetes, infection with viruses such as coxsackie virus B3 (CVB3) and lymphocytic choriomeningitis virus (LCMV) prevents the development of disease. Filippi and colleagues investigated the mechanisms of this protection. They found that infection with CVB3 or LCMV, which does not cause damage to pancreatic β-cells, delayed the onset of diabetes and reduced the incidence of disease in NOD mice. Protection was mediated by the synergistic effects of a transient increase in the expression of the inhibitory receptor programmed cell death ligand 1 — which prevented the expansion of diabetogenic $CD8^+$ T cells — and increased numbers of $FOXP3^+$ regulatory T cells that showed enhanced production of the suppressor cytokine transforming growth factor-β.

NKT CELLS

Tie2cre-induced inactivation of the miRNA-processing enzyme Dicer disrupts invariant NKT cell development

Zhou, L. *et al. Proc. Natl Acad. Sci. USA* 9 Jun 2009 (doi:10.1073/pnas.0811119106)

In this study, the authors looked at the role of microRNAs — the small RNAs that are increasingly recognized for their role as regulators of gene expression — in the development of invariant natural killer T (iNKT) cells. They generated mice in which the expression of Dicer, which processes microRNAs, was conditionally ablated in haematopoietic cells and endothelial cells. The numbers and function of thymic and peripheral iNKT cells were significantly altered in mice deficient in Dicer, and Dicer-deficient iNKT cells did not respond well to stimulation with the synthetic ligand α-galactosylceramide. So, in line with the emerging role of microRNAs in other lymphocytes, microRNAs are potent regulators of iNKT cell development and function.

T CELL RESPONSES

Cutting edge: γδ intraepithelial lymphocytes of the small intestine are not biased toward thymic antigens

Jensen, K. D. C. *et al. J. Immunol.* **182**, 7348–7351 (2009)

Intraepithelial lymphocytes (IELs), comprising both αβ and γδ T cells, provide a first line of defence against intestinal pathogens. Although the ligand specificity of αβ IELs is known to be restricted by selection on self peptide–MHC complexes in the thymus, it has been unclear whether γδ IELs are also selected by thymic antigens. This study shows that γδ IELs specific for the non-classical MHC class I molecules T10 and T22 develop similarly in mice in both the presence and absence of T10 and T22 expression. This indicates that ligand expression is neither inhibitory nor required for the development of γδ IELs. Furthermore, γδ T cells that have not yet encountered their ligand express higher levels of the gut-homing receptor CC-chemokine receptor 9, and γδ IELs are mainly antigen naive. Therefore, γδ IELs seem to be biased towards antigens that are not encountered in the thymus, making them ideally suited to respond to antigens derived from pathogens or 'stressed' cells that the host encounters for the first time.