IN BRIEF

MHC MOLECULES

MHC class II-peptide complexes internalize using a clathrin- and dynamin-independent endocytosis pathway.

Walseng, E. *et al. J. Biol. Chem.* 7 April 2008 (doi:10.1074/jbc.m801070200)

Recycling of peptide–MHC class II complexes from the cell surface is thought to increase the repertoire of peptides available for presentation, but the molecular mechanisms behind this recycling is not known. Newly synthesized invariant chain (Ii)-associated MHC class II molecules are known to travel from the *trans*-Golgi network to the cell surface where they enter the endocytic pathway by clathrin- and dynamin-mediated endocytosis for delivery to the antigen-processing compartments. Now, Walseng *et al.* show that, by contrast, the internalization of complexes involves a clathrin- and dynamin-independent pathway. Internalized peptide–MHC class II complexes entered elongated tubules that contained GTPases associated with protein recycling, suggesting that these complexes rapidly recycle back to the cell surface through these tubules.

B-CELL SIGNALLING

Erk kinases link pre-B cell receptor signaling to transcriptional events required for early B cell expansion.

Yasuda, T. *et al. Immunity* **28**, 499–508 (2008)

Much is known about the proximal pre-B-cell receptor (BCR) signalling events that regulate B-cell development but how these signals are transduced to the nucleus is less clear. SYK- and SRC-family members are known to be activated by the pre-BCR, so serine and threonine kinases downstream of these proteins could be possible intermediate signal transducers. Two such kinases are extracellular-signal-regulated kinase 1 (ERK1) and ERK2. Yasuda *et al.* generated inducible-ERK double-deficient mice and found that the transition of pro-B cells to pre-B cells was defective in these mice. Further analysis showed that ERK1 and ERK2 were activated by pre-BCR signals downstream of SYK and ZAP70 and were required for pre-BCR-mediated cell expansion through the activation of the transcription factors ELK1 and CREB.

T-CELL DEVELOPMENT

Skint1, the prototype of a newly identified immunoglobulin superfamily gene cluster, positively selects epidermal γδ T cells.

Boyden, L. M. *et al. Nature Genet.* 13 April 2008 (doi:10.1038/ng.108)

This paper investigated Vγ5$^+$Vδ1$^+$ T cells — which normally comprise 90% of mouse epidermal γδ T cells — that are deficient in FVB/N mice from Taconic Laboratories (FVB_{Tac} mice) but not in the FVB/N strain from Jackson Laboratories (FVB_{Jax} mice). Positional cloning identified a single nucleotide substitution (resulting in a premature stop codon) in FVB_{Tac} mice compared with FVB_{Jax} mice in a partially predicted gene sequence that the authors have now characterized and named *Skint1* (for selection and upkeep of intraepithelial T cells 1). *Skint1* is expressed by thymic epithelial cells and keratinocytes, but not by Vγ5$^+$Vδ1$^+$ T cells. Wild-type *Skint1* could rescue the Vγ5$^+$Vδ1$^+$ T-cell deficiency of FVB_{Tac} mice, and the authors propose that *Skint1* might engage a cell-surface molecule, possibly the Vγ5$^+$Vδ1$^+$ T-cell receptor (TCR) itself, on Vγ5$^+$Vδ1$^+$ T cells in the embryonic thymus to mediate positive selection.