IN BRIEF

B CELL RESPONSES

Follicular DC traps protect antigens

Follicular dendritic cells (FDCs) promote adaptive immune responses by retaining and presenting antigens to B cells in the lymph nodes, but it has been unclear how FDCs are able to retain antigens for such long periods of time. Heesters *et al.* show that FDCs express complement receptors and that they use these to acquire complement-coated immune complexes from non-cognate B cells. Having internalized these complexes, FDCs retain the immune complexes in non-degradative cycling compartments. The complexes are periodically recycled to the cell surface of the FDCs and become available to cognate B cells. The authors suggest that this pathway could also be used to share antigens between neighbouring FDCs.

ORIGINAL RESEARCH PAPER Heesters, B. A. *et al.* Endocytosis and recycling of immune complexes by follicular dendritic cells enhances B cell antigen binding and activation. *Immunity* 13 Jun 2013 (doi:10.1016/j.immuni.2013.02.023)

T CELL RESPONSES

Tuberculosis traps are highly conserved

Van Rhijn *et al.* have uncovered a unique population of T cells that recognizes lipids presented by the non-polymorphic antigen-presenting molecule CD1b. These T cells use a conserved αβ T cell receptor (TCR) — termed a germline-encoded mycolyl lipid-reactive (GEM) TCR — to recognize CD1b-presented lipids. GEM T cells are present in the naive T cell repertoire and their numbers are increased in patients with tuberculosis. They produce high levels of interferon-γ and tumour necrosis factor in response to CD1b-bound glucose monomycolate (a mycobacterial lipid), suggesting that they have antimicrobial functions. GEM TCRs comprise an essentially invariant α-chain and show highly biased β-chain selection; as such, GEM T cells seem to represent a novel innate-like lymphocyte population. The authors propose that tuberculosis vaccines could be designed to target and to expand the GEM T cell population, and that screens for the conserved GEM TCR α-chain could be used to diagnose patients with tuberculosis.

ORIGINAL RESEARCH PAPER Van Rhijn, I. *et al.* A conserved human T cell population targets mycobacterial antigens presented by CD1b. *Nature Immunol.* 2 Jun 2013 (doi:10.1038/ni.2630)

ANTIBODIES

Cow traps are structurally unique

Most antibody diversity occurs in the heavy-chain complementarity determining region 3 (CDR3), which comprises rearranged variable (V), diversity (D) and joining (J) gene segments. Humans and other vertebrates encode a large number of V, D and J gene segments and use V(D)J recombination to generate antibody diversity. By contrast, bovine antibodies are generated from a very limited V gene repertoire. Bovine antibodies are also unusual in that they have exceptionally long heavy-chain CDR3 regions that contain multiple cysteine residues. Wang *et al.* used deep sequencing analysis to show that bovine antibodies are generated through V(D)J recombination events and mutational mechanisms that promote the conversion of D residues in the CDR3 region to cysteine residues. These cysteine residues faciliate disulphide-bonding events that create unique 'microfolds' in the CDR3 region, and bovine antibodies form an unusual structure comprising a β-strand 'stalk' domain and a disulphide-bonded 'knob' domain. Such unique antibodies may bind antigenic targets that are difficult for traditional antibodies to access, such as channels and pores.

ORIGINAL RESEARCH PAPER Wang, F. *et al.* Reshaping antibody diversity. *Cell* **153**, 1379–1393 (2013)