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IN BRIEF

VIRAL DISEASES

Bacterial flagellin cures rotavirus

Rotavirus infection causes severe dehydrating diarrhoea in young children and is a leading cause of infant hospitalization. Here, Zhang *et al.* demonstrate that bacterial flagellin can protect mice from infection with rotavirus and cure mice with chronic infection. These effects are mediated through activation of Toll-like receptor 5 and NOD-like receptor C4 on dendritic cells, leading to the production of interleukin-22 (IL-22) and IL-18, respectively. In mice, co-administration of these cytokines confers complete protection against a broad range of rotavirus inoculation and eliminates established infection within 24 hours.

ORIGINAL RESEARCH PAPER Zhang, B. *et al.* Prevention and cure of rotavirus infection via TLR5/NLRC4-mediated production of IL-22 and IL-18. *Science* **346,** 861–865 (2014)

ANTICANCER AGENTS

CDK7 inhibition suppresses MYC-dependent cancer

Many human cancers depend on deregulated expression of MYC family members for growth and proliferation. Deregulated MYC is transcriptionally regulated by 'super-enhancers' (clusters of enhancers that are occupied densely by transcription factors, cofactors and chromatin regulators). Here, the authors report that a covalent inhibitor of cyclin dependent kinase 7 (CDK7), THZ1, disrupts the transcription of amplified MYCN in neuroblastoma cells and induces tumour regression in a mouse model of neuroblastoma. The selectivity of THZ1 for MYCN-amplified cells correlates with reduced expression of super-enhancer-associated oncogenic drivers, including MYCN.

ORIGINAL RESEARCH PAPER Chipumuro, E. *et al.* CDK7 inhibition suppresses super-enhancer-linked oncogenic transcription in MYCN-driven cancer. *Cell* **159,** 1126–1139 (2014)

CANCER

Cancer exosomes promote tumorigenesis

Exosomes — nano-vesicles secreted by multiple cell types, including cancer cells, which contain proteins, mRNA and microRNAs (miRNAs) — are believed to promote tumour growth and progression. Here, Melo *et al.* show that exosomes derived from cancer cells and serum from patients with breast cancer contain the RNA-induced silencing complex (RISC)-loading complex proteins, Dicer, TAR RNA-binding protein 2 (TRBP) and Argonaute-2 (AGO2), and show capacity for cell-independent miRNA biogenesis. In cell culture and mice models, these cancer exosomes rapidly silence mRNAs to alter the transcriptome of recipient cells, stimulating non-tumorigenic epithelial cells to form tumours in a Dicer-dependent manner.

ORIGINAL RESEARCH PAPER Melo, S. A. *et al.* Cancer exosomes perform cell-independent microRNA biogenesis and promote tumorigenesis. *Cancer Cell* **26,** 707–721 (2014)

BONE DISORDERS

BET inhibitor prevents bone loss

Receptor activator of NF-κB ligand (RANKL) is a key factor in osteoclast differentiation that induces changes in the chromatin state of osteoclast precursors. However, the epigenetic mechanisms that regulate osteoclast differentiation have not been well clarified. Park-Min *et al.* report that the benzodiazepine derivative, I-BET151, a small-molecule inhibitor of BET proteins (which bind to acetylated histones and control gene transcription), suppresses RANKL-induced osteoclastogenesis and prevents bone loss in several mouse disease models. I-BET151 was shown to target a MYC–nuclear factor of activated T cells (NFAT) axis important for osteoclastogenesis.

ORIGINAL RESEARCH PAPER Park-Min, K.-H. *et al.* Inhibition of osteoclastogenesis and inflammatory bone resorption by targeting BET proteins and epigenetic regulation. *Nature Comm.* **5,** 5418 (2014)