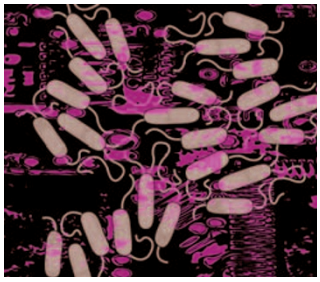
IN BRIEF



ANTIBACTERIAL DRUGS

Mechanism of thiomide drug action against tuberculosis and leprosy.

Wang, F. *et al. J. Exp. Med.* **204**, 73–78 (2007)

Despite the widespread use of thiomide drugs to treat multidrug-resistant tuberculosis and leprosy, their precise mechanism of action is unknown. Now, Wang and colleagues have shown that thiomides covalently bind with nicotinamide adenine dinucleotide, and that these adducts are tight binding inhibitors of *Mycobacterium tuberculosis* and *Mycobacterium leprae* InhA, a reductase involved in mycolic acid biosynthesis. The knowledge of the precise structures and mechanisms of action of these drugs could provide insight into the design of new drugs that can overcome resistance.

ANTICANCER DRUGS

A mitochondria–K^+ channel axis is suppressed in cancer and its normalization promotes apoptosis and inhibits cancer growth.

Bonnet, S. *et al. Cancer Cell* **11**, 37–51 (2007)

The unique metabolic profile of cancer could confer resistance to apoptosis and therefore lead to cancer progression. Bonnet and colleagues have shown that metabolic-electrical remodelling, characterized by hyperpolarized mitochondria and downregulated voltage-gated potassium channels, regulates apoptotic resistance. Dichloroacetate, a metabolic modulator used for many years to treat lactic acidosis, reverses this remodelling, induces apoptosis and decreases cancer growth *in vivo*. Therefore, metabolic modulators, particularly dichloroacetate, could be beneficial in treating cancer.

STEM CELLS

Therapeutic targeting of a stem cell niche.

Adams, G. B. *et al. Nature Biotech.* 21 Jan 2007 (doi:10.1038/nbt1281)

Targeting the specialized niche where stem cells reside — rather than the stem cell itself — might improve stem-cell-based therapies. Adams and colleagues have shown that the activation of the parathyroid hormone receptor on the osteoblastic niche in mice increases the number of adult haematopoietic stem cells mobilized into the peripheral blood for stem-cell harvests, protects stem cells from repeated exposure to cytotoxic chemotherapy and expands stem cells in transplant recipients. Therefore, the niche could be an attractive target for drug-based stem-cell therapeutics.

ANTICANCER DRUGS

Small-molecule inhibition of the interaction between the translation initiation factors eIF4E and eIF4G.

Moerke, N. J. *et al. Cell* **128**, 257–267 (2007)

The tumour suppressor activity of cellular 4E-binding proteins (4E-BP) occurs as a result of their ability to inhibit the assembly of the translation-initiation-factor complex eIF4E–eIF4G. Moerke and colleagues identified a small-molecule inhibitor of this interaction, which mimics the effects of 4E-BP. The compound inhibited cellular expression of oncogenic proteins encoded by weak mRNAs and exhibited activity against multiple cancer cell lines. The identification of this compound provides a tool for studying translational control and identifies a possible new strategy for cancer therapy.