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IN BRIEF

MALARIA

Novel antimalarial target identified

Current antimalarial strategies are limited by the complex life cycle of *Plasmodium* parasites and the emergence of drug-resistant strains. With these challenges in mind, Kato *et al.* screened a diverse panel of 100,000 compounds, which were produced using diversity-oriented synthesis (DOS), to identify new multistage antimalarial compounds exhibiting novel mechanisms of action. This screen led to the identification of a series of bicyclic azetidines that inhibited a new target, phenylalanyl-tRNA synthetase. The bicyclic azetidine BRD7929 prevented disease transmission, ensured prophylaxis and displayed single low-dose cure, with activity against all *Plasmodium* parasite life stages in multiple mouse models.

ORIGINAL ARTICLE Kato, N. *et al.* Diversity-oriented synthesis yields novel multistage antimalarial inhibitors. *Nature* http://dx.doi.org/doi:10.1038/nature19804 (2016)

ANTICANCER AGENTS

ACC inhibition suppresses lung cancer

Targeting the elevated rate of *de novo* fatty acid synthesis (FASyn), which often occurs in tumour cells, has emerged as a promising therapeutic strategy. However, efforts to inhibit acetyl-CoA carboxylase (ACC) — the rate-limiting enzyme in FASyn — have so far been unsuccessful. Svensson *et al.* now show that ACC1 is highly expressed in human non-small-cell lung cancer (NSCLC) cell lines and that activity of this enzyme maintains NSCLC cell growth and viability *in vitro* and *in vivo*. Chronic treatment of xenograft and genetically engineered mouse models of NSCLC with the small-molecule allosteric ACC inhibitor ND-646 significantly inhibited tumour growth.

ORIGINAL ARTICLE Svensson, R. U. *et al.* Inhibition of acetyl-CoA carboxylase suppresses fatty acid synthesis and tumor growth of non-small-cell lung cancer in preclinical models. *Nat. Med.* **22**, 1108–1119 (2016)

LYSOSOMAL STORAGE DISEASES

HSP70 reverses lysosomal pathology

Existing treatment options for the lysosomal storage diseases (LSDs) known as sphingolipidoses are limited and have little efficacy against neurological manifestations. Here, Kirkegaard *et al.* report that recombinant human heat shock protein 70 (HSP70) enhances binding of sphingolipid-degrading enzymes to their essential cofactor bis(monoacylglycero)phosphate *in vitro*, an effect that reversed lysosomal pathology in primary fibroblasts from individuals with LSD. Administration of HSP70 or arimoclomol (an orally available small-molecule co-inducer of HSPs currently in clinical trials) attenuated sphingolipid accumulation, disease progression and neurological symptoms in mouse models of sphingolipidoses.

ORIGINAL ARTICLE Kirkegaard, T. *et al.* Heat shock protein-based therapy as a potential candidate for treating the sphingolipidoses. *Sci. Transl. Med.* **8**, 355ra118 (2016)

AUTOIMMUNE DISEASE

CK2 blockade ameliorates EAE

T helper 17 (T_H17) cells infiltrating the central nervous system are believed to have a crucial role in experimental autoimmune encephalomyelitis (EAE) and multiple sclerosis. Here, Ulges *et al.* report that genetic ablation or pharmacological blockade of the protein casein kinase 2 (CK2) inhibits encephalitogenic human and mouse T_H17 cell development and effector function but promotes protective regulatory T cell development. In EAE-affected mice, daily intraperitoneal administration of the small-molecule CK2 inhibitor CX4945 reduced disease severity and protected mice from relapse.

ORIGINAL ARTICLE Ulges, A. *et al.* Protein kinase CK2 governs the molecular decision between encephalitogenic T_H17 cell and T_{reg} cell development. *Proc. Natl Acad. Sci. USA* **113**, 10145–10150 (2016)