

IN BRIEF

CARDIOVASCULAR DISEASE**Dietary supplement protects the heart**

Ageing is typically associated with cardiac hypertrophy and decline of diastolic function. Eisenberg *et al.* report that dietary supplementation with the natural polyamine spermidine significantly extends the median lifespan of mice. Moreover, in aged mice, spermidine reversed age-associated hypertrophy and improved cardiac diastolic function through modulation of autophagy. Spermidine supplementation also lowered blood pressure and improved cardiac function in a rat model of hypertension-induced congestive heart failure. In human subjects, dietary intake of spermidine was inversely associated with high blood pressure and risk of cardiovascular disease.

ORIGINAL ARTICLE Eisenberg, T. *et al.* Cardioprotection and lifespan extension by the natural polyamine spermidine. *Nat. Med.* **22**, 1428–1438 (2016)

ANTIBACTERIALS**Microcins limit intestinal infection**

Small proteins known as microcins that are secreted from commensal intestinal bacteria exhibit antibacterial properties *in vitro*. Sassone-Corsi *et al.* now show in mouse colitis models, that inoculation with a probiotic microcin-secreting *Escherichia coli* strain (EcN) outcompetes and limits gut colonization with commensal *E. coli*, *Salmonella enterica* serovar Typhimurium (STm) and adherent invasive *E. coli* (frequently isolated from patients with Crohn disease), in contrast to a mutant EcN unable to secrete microcins. EcN inoculation also reduced STm colonization, inflammation and weight loss in mice with an active STm infection.

ORIGINAL ARTICLE Sassone-Corsi, M. *et al.* Microcins mediate competition among Enterobacteriaceae in the inflamed gut. *Nature* <http://dx.doi.org/10.1038/nature20557> (2016)

ALZHEIMER DISEASE**BACE1 inhibitor reduces β -amyloid production in humans**

Inhibition of aspartyl protease β -site amyloid precursor protein cleaving enzyme 1 (BACE1), required for production of β -amyloid (A β) peptides, is an attractive approach to lower A β levels in AD. Kennedy *et al.* present verubecestat (MK-8931), the first BACE1 inhibitor to reach phase III clinical trials. Orally administered verubecestat safely reduced plasma, cerebrospinal fluid (CSF), and cortical A β_{40} , A β_{42} and soluble amyloid precursor protein- β (sAPP β) production in rats and monkeys. In both healthy human subjects and patients with AD, verubecestat reduced A β_{40} , A β_{42} and sAPP β in the CSF and was well-tolerated.

ORIGINAL ARTICLE Kennedy, M. E. *et al.* The BACE1 inhibitor verubecestat (MK-8931) reduces CNS β -amyloid in animal models and in Alzheimer's disease patients. *Sci. Transl. Med.* **8**, 363ra150 (2016)

COMPUTATIONAL CHEMISTRY**Novel virtual screening approach**

Structure-based drug discovery methods are generally based on predicting the binding affinity of a ligand to a protein. Ruiz-Carmona *et al.* introduce a novel computational procedure termed dynamic undocking (DUck), which evaluates the structural stability of protein–ligand complexes. DUck calculates the work needed to break a key native contact and reach a quasi-bound state. In test systems, active compounds were structurally stable and presented higher quasi-bound values than inactive ones. DUck is orthogonal to existing virtual screening methods: in a fragment screening against HSP70, DUck identified novel chemotypes and had a hit rate of 38%.

ORIGINAL ARTICLE Ruiz-Carmona, S. *et al.* Dynamic undocking and the quasi-bound state as tools for drug discovery. *Nat. Chem.* <http://dx.doi.org/10.1038/nchem.2660> (2016)