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IN BRIEF

NAFLD

Boosting hepatic NAD+ prevents and reverses NAFLD in mice

Few therapies are approved for the treatment of NAFLD. Now, researchers have shown that treatment with nicotinamide riboside, a precursor for NAD+ biosynthesis, can protect mice against the development of diet-induced NAFLD by increasing hepatic NAD+ levels. The treatment also reversed the disease in mice with pre-existing NAFLD. Nicotinamide riboside activated the hepatic mitochondrial unfolded protein response, increasing fatty acid oxidation and mitochondrial complex activity.

Original article Gariani, K. *et al*. Eliciting the mitochondrial unfolded protein response via NAD+ repletion reverses fatty liver disease. *Hepatology* doi:10.1002/hep.28245

INFECTION

A non-antibiotic treatment for *Clostridium difficile* infection?

Investigators have identified a non-antibiotic drug active against *Clostridium difficile* virulence factors, according to a new study published in *Science Translational Medicine*. Targeted screening of compounds for inhibitory activity against the cysteine protease domain within the *C. difficile* major virulence factor toxin B, identified a bioactive compound currently in human clinical trials for an unrelated indication. In a mouse model of *C. difficile* infection, the drug reduced disease pathology and inhibited release of the toxic glucosyltransferase domain.

Original article Bender, K. O. *et al*. A small-molecule antivirulence agent for treating *Clostridium difficile* infection. *Sci. Transl. Med.* **7**, 306ra148 (2015)

IBS

Visceral hypersensitivity linked to histone acetylation

Early-life stress is associated with an increased risk of gastrointestinal disorders including IBS. In mice exposed to early-life stress caused by maternal separation, the researchers found an increased number of pain behaviours and visceral hypersensivity compared with mice that did not experience early-life stress. These changes were associated with altered histone acetylation in regions of the spine critical to visceral pain processing. Treatment of mice exposed to early-life stress with a histone deacetylase inhibitor, suberoylanilide hydroxamic acid, reversed visceral hypersensitivity and stress-induced faecal output. The authors suggest that modulation of epigenetic machinery could form the basis of new anti-IBS drugs.

Original article Moloney, R. D. *et al*. Early-life stress-induced visceral hypersensitivity and anxiety behavior is reversed by histone deacetylase inhibition. *Neurogastroenterol. Motil.* doi:10.1111/nmo.12675

GUT MICROBIOTA

A new microbial niche in the intestinal outer mucus layer

The composition and distribution of gut microbiota is known to vary along the length of intestinal tract. New research published in *Nature Communications* is the first to show that the outer mucus layer of the large intestine is itself a distinct microbial niche. The investigators showed that bacteria species present in the outer mucus layer both proliferate and utilise resources differently, when compared with the same species found in the intestinal lumen.

Original article Li, H. *et al*. The outer mucus layer hosts a distinct intestinal microbial niche. *Nat. Commun.* doi:10.1038/ncomms9292