RESEARCH HIGHLIGHTS

CARDIOVASCULAR BIOLOGY

Gut microbes raise heart-attack risk

Gut microbes produce a chemical that enhances clotting in the arteries, increasing the risk of heart attack and stroke.

Stanley Hazen of the Cleveland Clinic in Ohio and his colleagues treated human platelets, which form blood clots, with a compound called TMAO. This is made in the body from a waste product of gut microbes, and has been linked to heart disease. The team found that TMAO made the platelets form artery-blocking clots faster. The researchers increased blood TMAO levels in mice by feeding them a diet that was rich in choline, a TMAO precursor, and found that the animals formed clots faster than did those with lower TMAO levels.

This effect was not seen in animals that lacked gut microbes or that were treated with antibiotics. When intestinal microbes from mice that produced high levels of TMAO were transplanted into mice with no gut microbes, the recipients' clotting risk increased. The results reveal a link between diet, gut microbes and heart-disease risk, the authors say.

Cell **http://doi.org/bdb2 (2016)**

CHEMICAL ENGINEERING

Waste gas makes liquid fuel

Waste gases containing carbon dioxide can be converted into diesel, thanks to a bacterium and an engineered yeast.

Gregory Stephanopoulos and his colleagues at the Massachusetts Institute of Technology in Cambridge developed a two-stage process that uses bioreactors to create liquid fuel out of gas mixtures containing CO_2. The first stage involves the bacterium *Moorella thermoacetica*, which converts mixtures of CO_2 and other gases such as carbon monoxide or hydrogen into acetic acid. An engineered yeast, *Yarrowia lipolytica*, then transforms the acetic acid into an oil that can be turned into diesel using existing industrial processes.

This method, with further enhancements to boost efficiency, could be used to produce fuel from the waste gases that are generated by industrial sites such as steel mills and coal-fired power plants, the authors say.

Proc. Natl Acad. Sci. USA **http://doi.org/bdb5 (2016)**

TAKAO ONOZATO/AFLO/GETTY

ANIMAL BEHAVIOUR

Order of notes is key in bird calls

A bird species derives different meanings from varying combinations of notes, just as humans understand complex meanings from words combined in different ways.

Toshitaka Suzuki of the Graduate University for Advanced Studies in Hayama, Japan, and his colleagues played recordings of four notes — A, B, C and D — in different orders for the Japanese great tit (*Parus minor*; pictured), which normally uses more than ten different notes in its calls. Playing ABC prompted the birds to scan horizontally for predators. On hearing a repeated D note, the birds approached the source of the calls. ABC–D calls elicited both behaviours, but playing D–ABC invoked little or no response.

The authors suggest that the order of the notes determines meaning, and say that this is the first experimental evidence for 'compositional syntax' in a wild animal.

Nature Commun. *7*, **10986 (2016)**

CANCER

Gene blocks anti-tumour response

A common cancer gene works in part by helping tumours to evade immune cells.

Dean Felsher of Stanford University in California and his colleagues studied the effects of *MYC* — a gene that is often overexpressed in cancer — in a mouse model of a type of leukaemia. They found that higher *MYC* expression levels increased the production of two proteins, PD-L1 and CD47, that help cancer cells to hide from the immune system. When *MYC* was inactivated, CD47 and PD-L1 levels dropped and tumour size decreased. Tumour data from humans showed a strong link between levels of *MYC* expression and levels of these immune-evasion signals.

People with cancers that overexpress *MYC* could benefit from treatments that