

CARDIOVASCULAR BIOLOGY

Mutations lower heart-disease risk

Two groups have found rare gene mutations linked to reduced blood fat levels and a lower risk of heart disease.

The *APOC3* gene codes for a protein that increases blood triglyceride levels — a known risk factor for heart disease. So, Anne Tybjaerg-Hansen at the Copenhagen University Hospital and her colleagues sequenced the protein-coding regions of the gene in more than 10,000 people and found three rare mutations associated with low blood triglyceride levels. They analysed these mutations in an additional 65,000 people and found that individuals with any of the mutations had a 36–41% lower risk of heart disease and stroke than people without any of the mutations.

Sekar Kathiresan at the Broad Institute in Cambridge, Massachusetts, and his team sequenced the protein-coding regions of nearly 20,000 genes from more than 3,500 participants and came up with four mutations in the same gene with similar effects.

The findings suggest that lowering blood triglyceride levels could protect against heart disease.

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NEUROSCIENCE

Brain circuit spurs social behaviour

Neuroscientists have pinpointed a specific set of neurons that connects two brain areas and regulates social behaviour in mice.

Karl Deisseroth and his colleagues at Stanford University in California used a variety of technologies to identify the exact circuitry

involved in the behaviours adopted by mice encountering an unfamiliar mouse or object. The team found that activity of cells in the ventral tegmental area (VTA) region of the brain increased during exploration of both the mouse and the object. Stimulating the firing of the VTA cells that project into the nucleus accumbens increased the animals' exploration of their new companion — but not the object. The mice also seem to use this circuitry for natural social exploration.

Studying the brain circuits, and not just the molecules,

involved in social behaviour could lead to new insight into some neuropsychiatric disorders, the authors say. *Cell* 157, 1535–1551 (2014)

ATMOSPHERIC SCIENCE

Arctic heat lessens cold snaps

The middle latitudes of the Northern Hemisphere have experienced fewer cold snaps during autumn and winter, thanks to Arctic warming.

Earlier studies have linked unusually frigid winters in

North America and Europe over the past decade to changes in atmospheric circulation caused by rising Arctic temperatures. But when James Screen of the University of Exeter, UK, analysed global temperature data from 1979 to 2013, he found that the frequency and severity of autumn and winter cold extremes decreased during this period. In these seasons, the coldest days in the Northern Hemisphere's high and middle latitudes have warmed faster than the warmest days, reducing overall temperature



RICHARD ELLIS/ALAMY

ANIMAL BEHAVIOUR

Magnetic compass guides butterflies

On overcast days, monarch butterflies use a magnetic compass to find their way south, making them one of only a few migratory insects known to sense Earth's magnetic field.

The eastern North American monarch butterflies (*Danaus plexippus*; pictured) use the Sun to guide them from southern Canada and the United States towards Mexico, but they still manage to fly in the correct direction on cloudy days. Steven Reppert at the University of Massachusetts Medical School in Worcester and his team studied butterflies in a flight

simulator inside an artificial magnetic field. The authors found that the butterflies changed their flight orientation when the researchers shifted the magnetic field, but only when the insects were exposed to certain wavelengths of light.

The insects' antennae could contain magnetosensors, the authors say, adding that human-induced electromagnetic noise might disrupt the butterflies' migration.

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