

COMPUTING

A faster brain-inspired computer

A computer that mimics the way the brain works, and contains both optical and electronic parts, can recognize simple speech three times faster than earlier devices that used only optical components.

Reservoir computers use neural networks made of interconnected units that relay signals in recurrent, closed loops, allowing them to store information from the past and 'learn' from it. These devices are usually light-based, but Laurent Larger and his colleagues at the University of Burgundy Franche-Comté in Besançon, France, designed a simpler architecture that incorporates off-the-shelf electronics and encodes information differently using the light signals, allowing for faster performance. In speech-recognition tests, the team's device processed 1 million words per second with error rates of less than 9%.

The device could be miniaturized and put on a chip, the authors say. *Phys. Rev. X* 7, 011015 (2017)

CANCER BIOLOGY

Rogue metabolite halts DNA repair

A range of cancers could have new treatment options thanks to the discovery that a metabolite made by many tumours increases their vulnerability to a class of drug.

Tumours resort to a number of metabolic tricks to support their continued growth and survival. One metabolite that has been linked to cancer is 2-hydroxyglutarate, which is made by mutated forms of either of two proteins: IDH1 or IDH2.



EVOLUTION

Origin of vertebrate gills

The ancestor of all living vertebrates may have had gills, a finding that adds to a long-standing debate about the evolutionary history of gills.

In jawless animals such as lampreys, gills form from the embryo's innermost layer of cells, or 'endoderm', whereas in jawed vertebrates, including many fish species, gills were thought to develop from the outermost layer, or 'ectoderm'. This led scientists to think that gills evolved separately in the two lineages.

Andrew Gillis and Olivia Tidswell at the University of Cambridge, UK, studied embryonic gill formation in the little skate (*Leucoraja erinacea*; pictured), a jawed vertebrate related to sharks and rays. They found that most of the gill tissue developed from the endoderm — as it does in jawless vertebrates.

The discovery that gills seem to grow from the same tissues in both jawless and jawed vertebrates suggests that gills may have evolved only once — in the vertebrates' common ancestor. *Curr. Biol.* <http://dx.doi.org/10.1016/j.cub.2017.01.022> (2017)

Peter Glazer and Ranjit Bindra at Yale University in New Haven, Connecticut, and their colleagues found that these mutations also cripple cells' ability to repair broken DNA. This makes tumour cells highly sensitive to a class of cancer drugs called PARP inhibitors, which are being used to treat cancers with similar DNA-repair defects. Inhibiting the mutated IDH1 enzyme reduced mutant cells' sensitivity to PARP inhibitors, whereas treatment with 2-hydroxyglutarate enhanced it in normal cells.

The results point to several types of cancer that could potentially be treated with these drugs.

Sci. Transl. Med. 9, eaal2463 (2017)

GLACIOLOGY

East Antarctica's Weddell woe

The immense East Antarctic ice sheet may be more vulnerable to rising temperatures in the Weddell Sea than previously thought.

Earlier studies have predicted that most of the ice lost from Antarctica as a result of global warming will be from the West Antarctic Ice Sheet. To study the much larger ice sheet in East Antarctica, Nick Golledge at Victoria University of Wellington and his team used a three-dimensional ice-sheet model to simulate the way ice flow across the continent responds to a changing climate in various warming scenarios. They predict that most of the melting to affect East Antarctica will originate in the Recovery basin, thanks to the warming Weddell Sea, which abuts this basin.

Climate models suggest that by the end of the century, the eastern Weddell Sea could