

DIAGNOSTICS

Fast Zika test developed

A low-cost paper-based test can rapidly detect low levels of Zika virus in human blood samples.

James Collins at the Massachusetts Institute of Technology in Cambridge and his colleagues previously designed a paper-based test for Ebola virus. Specially programmed RNA 'sensors' embedded in paper strips bind to viral RNA sequences, triggering a chemical reaction that changes the colour of the paper. The researchers adapted this for the Zika virus, and added a step that boosts the amount of viral RNA, increasing the test's sensitivity. They detected Zika virus in human serum spiked to mimic samples from infected patients. The test also distinguished Zika from the related dengue virus, and can differentiate between two similar strains of Zika.

It takes about 5 days to design the RNA sensors and produce the paper strips, and roughly 3 hours to run the test, making the system potentially useful in future disease outbreaks, the authors say.

Cell <http://doi.org/bhjf> (2016)

ASTROPHYSICS

Model predicts neutron-star signal

Physicists have devised a fast, accurate model that recreates the gravitational-wave signals produced by spiralling and colliding neutron stars. The model could help researchers to work out the stars' properties.

The US Advanced Laser Interferometer Gravitational-Wave Observatory (LIGO) is looking for gravitational waves — ripples in space-time generated by cataclysmic cosmic events, such as



GEOCHEMISTRY

Ancient Earth rocks emerge from lava

Deep inside Earth are rocks that date back to the first 50 million years of the Solar System's history. The discovery suggests that, even as internal heating mixes most of Earth's interior, some primordial material still survives today.

A team led by Hanika Rizo of the University of Quebec in Montreal, Canada, analysed lava that erupted off the coast of northern Canada and the southwest Pacific Ocean, and then cooled

to form basalt rock (pictured). Both places are thought to tap deep and ancient sources of lava.

The scientists found that levels of tungsten-182 — an isotope created early in Earth's history by the radioactive decay of hafnium-182 — were higher in the Canadian and Pacific rocks than in those from other parts of the world, confirming that the rocks contained ancient materials.

Science 352, 809–812 (2016)

collisions of stars and other bodies. To learn more about neutron stars from these signals, researchers need a wide range of simulated examples of collisions for comparison. Creating a full simulation can take several weeks, so Tanja Hinderer at the University of Maryland in College Park and her colleagues produced a simplified model. By showing in detail how the stars deform under each other's strong gravitational pull, the model predicts waveforms that agree better with full simulations than do previous such models.

The authors plan to use their model to create thousands of different possible waveforms that will help researchers to interpret LIGO data.

Phys. Rev. Lett. 116, 181101 (2016)

GENETICS

Genes linked to different traits

Seemingly unrelated biological traits, such as the risk of schizophrenia and of inflammatory bowel disease, can be linked to the same gene variants.

One version of a gene can affect multiple traits, but identifying whether a specific gene variant affects two unrelated pathways has been difficult. Joseph Pickrell of the New York Genome Center and his team analysed data from 43 genome-wide association studies (GWAS) that correlated gene variants with traits such as height, nose size and neurological disorders. They found several clusters of traits

that shared common genetic roots, such as one associated with lower body-mass index, increased height and reduced risk of male pattern baldness.

Considering data from many traits is important when studying the effect of a genetic variant, the authors say.

Nature Genet. <http://dx.doi.org/10.1038/ng.3570> (2016)

ASTRONOMY

Black hole weighed with precision

Astronomers have made precise measurements of the mass of a supermassive black hole.

Aaron Barth of the University of California in Irvine focused the Atacama Large Millimeter/