RESEARCH HIGHLIGHTS

Selections from the scientific literature

BIOENGINEERING

Muscle in a dish twitches

Human muscle that contracts has been grown in the lab.

Existing models of human skeletal muscle are two-dimensional and do not mimic the structure or behaviour of natural tissue well. Nenad Bursac at Duke University in Durham, North Carolina, and his colleagues took samples of living human muscle cells and grew them in three dimensions using a scaffold. This coaxed the cells into forming muscle that could spontaneously twitch. When the team stimulated it with electrical pulses similar to nerve signals, the muscle contracted.

The tissue also responded to various drugs, including a steroid-like one, in much the same way as human muscles. The researchers plan to use their tissue to test drugs for muscle disorders.

eLife **http://doi.org/zfs (2015)**

COSMOCHEMISTRY

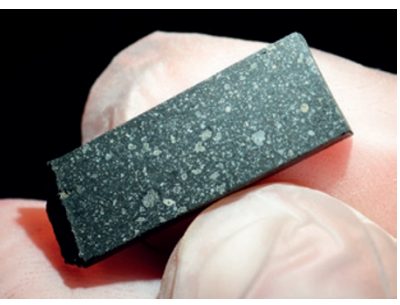
How nitrogen got to Earth

Earth's nitrogen may have originated in the icy reaches of the primordial Solar System.

A team led by Dennis Harries of the University of Jena in Germany discovered and analysed a chromium nitride mineral inside two meteorites (**pictured**). The researchers say that the mineral could have formed from ammonia in ices that swirled around the newborn Sun. Shock waves from distant collisions between fragments in this protoplanetary disk heated up the ammonia, releasing it to react with metals such as chromium. The team also found that the isotopic signature of the nitrogen in the mineral is similar to that of Earth's atmospheric nitrogen.

Much of the early Solar System's nitrogen could have been released in this way, with some ending up in Earth's early atmosphere, the authors suggest.

Nature Geosci. **http://dx.doi.org/10.1038/ngeo2339 (2015)**



DENNIS HARRIES

J. ROGER BROTHERS

ANIMAL BEHAVIOUR

Turtles' magnetic attraction to home

Sea turtles use geomagnetic signatures to return to nesting sites near where they were born.

These animals navigate across oceans using Earth's magnetic field, but it has been unclear how they find the same coastal nesting sites as their mothers. Roger Brothers and Kenneth Lohmann at the University of North Carolina in Chapel Hill studied loggerhead sea turtles (*Caretta caretta*; pictured) in Florida.

They found that the location of the animals' nests each season was associated with changes in the strength and direction of Earth's magnetic field at each site. In areas where the same magnetic signature spreads out over time, nests were made farther apart. When the signature shrank, the nests were closer together.

Similar mechanisms could be at work in other animals that migrate back to their birthplaces, the authors suggest.

Curr. Biol. **http://doi.org/zc7 (2015)**

DEVELOPMENTAL BIOLOGY

Stem cells for bone growth

Stem cells that give rise to bone and cartilage in mice after birth have been found by two teams.

A group led by Siddhartha Mukherjee and Timothy Wang at Columbia University in New York found that cells at the ends of mouse bones can produce other cells that make bone, cartilage and the spongy tissue in bone marrow. When implanted near a broken bone, these stem cells developed into bone-making cells.

Charles Chan and Michael Longaker at Stanford University in California and their colleagues identified mouse stem cells with similar capabilities, as well as the molecular signals that maintain such cells and guide their development. When combinations of these factors were added to fat tissue in mice along with collagen protein, bone or cartilage formed a month later.

Cell 160, **269–284; 285–298 (2015)**

ECOLOGY

Small trees save forests

Small trees are often removed from conifer forests in dry areas to reduce the risk of wildfires, but a US study has