

### The leaf venation as formed in a tensorial field

Y. Couder, L. Pauchard, C. Allain, M. Adda-Bedia and S. Douady  
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Noting that formation of biological patterns calls for breaking of symmetry, the authors investigated the pattern of fracture in a thin layer of gel and the venation in leaves, and concluded that these apparently unrelated processes could be described by a tensorial stress field. This approach is to further the understanding of the mechanical stresses involved in morphogenesis in plants.

### Gliding flight in the paradise tree snake

J. J. Socha  
*Nature*, 2002, **418**, 603–604

Flying snakes lack specialized appendages that could help them generate lift during aerial flight. To understand the aerial manoeuvres of vertebrate gliders lacking 'wings', the author videotaped the aerial movements of the paradise tree snake, *Chrysopolea paradisi*, at the Singapore Zoological Gardens. Analysis of their trajectory showed that lateral undulation in the air is the mechanism used by the snake to generate lift during flight. Despite such unconventional means of gliding, performance of *C. paradisi* in air is comparable to other flying vertebrates like squirrels, lizards and frogs.

### Vermicomposting of paper waste with the anecic earthworm

*Lampito mauritii* Kinberg  
S. Gajalakshmi, E. V. Ramaswamy and S. A. Abbasi  
*Ind. J. Chem. Technol.*, 2002, **9**, 306–311

Paper waste is a substantial part of the municipal solid waste in India. Incineration of this waste removes organic carbon in the form of CO<sub>2</sub>, in addition to producing ash, another solid waste. Vermicomposting had been explored as an alternative means of treating the paper waste with the possibility of recycling the organic carbon. The authors describe the long-term performance of the 'vermicoreactors' in 3 or 12 litres capacity circu-

lar plastic vermireactors using paper blended with cowdung as the feed material for the anecic earthworm *Lampito mauritii* Kinberg.

### Growth and structure evolution of novel tin oxide diskettes

Z. R. Dai, Z. W. Pan and L. Wang  
*J. Am. Chem. Soc.*, 2002, **124**, 8673–8680

Nano-structures of tin oxide are usually tubes, wires, and ribbons. Another novel structure, diskette, was synthesized by thermal evaporation of SnO or SnO<sub>2</sub> powders in the temperature zone of 200–400°C inside a horizontal tube furnace. The typical diameter of the diskettes is 8–10 µm with the aspect ratio of diameter-to-thickness about 15. The synthesized structure was characterized with SEM, TEM and XRD.

### A long-tailed, seed-eating bird from the early Cretaceous of China

Z. Zhou and F. Zhang  
*Nature*, 2002, **418**, 405–409

A new basal-bird, *Jeholornis prima*, is identified from the fossil preservations of the Yixian and Jiufotang formations of northeast China. This early Cretaceous large bird is evidently a link between birds and non-avian theropods, the features of pectoral girdle suggesting powerful flight. The ratio of the forelimb to hindlimb is much larger than that in *Archaeopteryx*. The maxilla bears no teeth, and 22 caudal vertebrae are well preserved in the holotype though feathers have not been preserved. Over 50 ovules, of 8–10 mm in dimension, were found in the stomach position, indicating that this arboreal was a seed eater.

### Generation and *in vitro* differentiation of a spermatogonial cell line

Li-Xin Feng *et al.*  
*Science*, 2002, **297**, 392–395

Establishing *in vitro* cell cultures to study spermatogenesis had been difficult. The authors created cell lines by immortalizing undifferentiated typeA spermatogonia cells obtained from BALB/C mice with the

help of a telomerase cDNA introduced through a retroviral vector. This immortalized cell line can be used to study spermatogenesis, and as a tool for transgenic modification leading to germ cell gene therapy in mice.

### Tracking enzymatic steps of DNA topoisomerases using single-molecule micromanipulations

T. R. Strick *et al.*  
*C.R. Phys.*, 2002, **3**, 595–618

Highly sensitive micromanipulation techniques available lately permits investigation of biomolecular processes in real time and over individual cycles in a single molecule. The authors studied the DNA twisting and unwinding in a single molecule DNA, attached to magnetic bead, as DNA topoisomerases catalysed such events. DNA topoisomerases from bacteria and *Drosophila* were used to track the enzymatic steps during micromanipulation of a dsDNA molecules labelled with biotin at one end and digoxigenin at the other. The molecules were then tethered to a magnetic bead coated with streptavidin and attached to a glass capillary coated with anti-digoxigenin. Such arrangements permitted measurement of elasticity of the DNA and accurate measurement on twisting of the molecule using magnetic tweezers. The experimental approach is applicable to diverse 'nanomachine' including molecular motors.

### Protein splicing triggered by small molecule

H. D. Mootz and T. W. Muir  
*J. Am. Chem. Soc.*, 2002, **124**, 9044–9045

Protein trans-splicing and small-molecule induced protein heterodimerization techniques were used to generate a conditional protein splicing system triggered by a small molecule. The proteins were over-expressed in *E. coli* and purified from the soluble fraction by chromatography. The 'inteins' and 'exteins' were spliced in presence of rapamycin only. These methods would be useful in manipulating protein functions *in vivo* and *in vitro*.