

## CANCER

### How cancer skirts brain defences

Proteins that block cell death and help cells to integrate with blood vessels are crucial in the spread of cancer to the brain.

Brain metastasis is often deadly, but most cancer cells that invade the brain die without establishing a tumour. To find ways in which successful invaders bypass the brain's defences, Joan Massagué of the Memorial Sloan Kettering Cancer Center in New York and his colleagues looked at a set of genes expressed in brain metastases, focusing on two proteins called serpins.

These serpins inhibit another protein called plasminogen activator, which, the authors found, kills cancer cells in the brain. Serpin expression shielded cancer cells from cell death and helped them to spread on the surface of capillaries, establishing a blood supply in their new home.

*Cell* 156, 1002–1016 (2014)

## MATERIALS

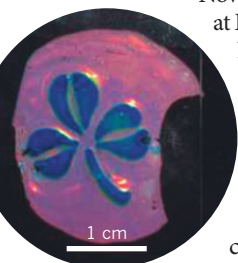
### Changing colour under pressure

Materials that change colour when pulled or squeezed could form the basis of display screens or sensors. But existing photonic gels, which change colour when deformed, cannot cover the entire rainbow or switch quickly.

Now, Jianping Ge at East China Normal University in Shanghai and his colleagues have created a material that can adopt every colour from red

to blue and is more sensitive to pressure than previous efforts, while being just as durable. The team used a mixture of ethylene glycol and polyethylene glycol methacrylate in which silica spheres were fixed to create a softer and more elastic gel (pictured). Like other photonic gels, the new material works because it forms a crystalline array of spheres, which alter light reflection by shifting orientation when squeezed.

*Adv. Funct. Mater.* <http://doi.org/rpn> (2014)



## ARCHAEOLOGY

### Ancient cheese found with mummies

The oldest known pieces of cheese have turned up in the tombs of an early Bronze Age cemetery in Xinjiang, China.

Andrej Shevchenko at the Max Planck Institute of Molecular and Cell Biology and Genetics in Dresden, Germany, Changsui Wang at the University of Chinese Academy of Sciences in Beijing, and their colleagues analysed 3,800-year-old lumps found at the neck and chest of mummies (pictured) in the cemetery and identified them as a 'kefir' cheese.

This type of cheese is made by curdling

ruminant milk with a symbiotic culture of bacteria, including *Lactobacillus kefiranofaciens*, and yeast. Evidence of a kefir dairy — which makes lactose-free products — in this region explains why large-scale ruminant herding and milking spread in a population known to have been lactose intolerant, the authors say. The origin of cheese making dates back some 4,000 years earlier, but evidence for this has relied on analysis of milk fat in pottery shards.

*J. Arch. Sci.* <http://doi.org/rpq> (2014)

## GENETIC ENGINEERING

### Genes make bacteria magnetic

Researchers have transferred genes for the production of magnetic nanocrystals from one species of bacteria to another, a step towards making bacterial bioreactors that generate such particles.

Dirk Schueler at Ludwig-Maximilians University in Munich, Germany, Youming Zhang at the

Helmholtz Joint Institute at Shandong University in Jinan, China, and their team focused on roughly 30 genes from *Magnetospirillum gryphiswaldense* that enable the bacterium to produce membrane-bound, iron-based magnetic nanocrystals. Researchers inserted these genes into *Rhodospirillum rubrum*, a well-studied organism used in biotechnology, that is easier to work with. The authors found that both sets of magnetic