CD47 or the protein that binds it, TSP1, which regulates cell growth and survival in response to stress, such as that caused by radiation. They found that suppressing the CD47–TSP1 pathway in normal human cells improved their survival after irradiation and, in mice, led to reduced radiation injury.

In addition, the tumours of mice treated with a CD47-blocking molecule prior to radiation exposure were up to 89% smaller 30 days after irradiation than those of mice receiving radiation alone.

BIOPHYSICS

All seeing eye

Nature Photon. doi:10.1038/nphoton.2009.189 (2009)

Polarized light is used in optical devices, including some microscopes. Being able to control polarized light is key. Materials such as crystals can do the job, but only within a limited range of wavelengths.

Nicholas Roberts of the University of Bristol, UK, and his colleagues have worked out how a species of mantis shrimp can switch polarized light from one form to another over a range of colours. A thin band of specialized receptor cells in the eyes of *Odontodactylus scyllarus* have just the right structure, dimensions and composition to enable them to control polarization over most of the visible spectrum. The team believes that further study of this mantis shrimp's eyes could lead to better optical devices.

NEUROSCIENCE

Brain signal source

Proc. Natl Acad. Sci. USA doi:10.1073/pnas.0905509106 (2009)

Functional magnetic resonance imaging (fMRI), used to map brain activity, gives a signal when the levels of oxygenated blood increase. The signal is often preceded by a darkening, thought to indicate early oxygen absorption by the brain owing to local neural activity.

But a study by Aniruddha Das and his colleagues at Columbia University in New York casts doubt on this. They used intrinsic signal optical imaging, a technique similar to fMRI, to measure changes in blood volume and blood oxygenation in the brains of two macaques while they performed a visual task.

The researchers found that during the initial darkening, blood-oxygen levels changed little, but blood volume increased markedly. The team suggests that blood-volume change is a better signal to use in brain imaging because it seems to be more closely linked to neural activity, occurring even before changes in blood oxygenation.

SEXUAL SELECTION

Intruder alert!

Proc. R. Soc. B doi:10.1098/rspb.2009.1554 (2009)

Male redback spiders can sneak in and quickly copulate with a female after a rival male has already spent hours wooing her, yet avoid the usual penalty of short courtship — being eaten prematurely by his lover.

The female Australian redback spider (*Latrodectus hasselti*, pictured below) eats the male after mating, but sometimes consumes him prematurely — after he's copulated only once. Jeffrey Stoltz and Maydianne Andrade of the University of Toronto in Canada measured the spiders' courtship durations and found that females tend to eat their partners prematurely if courtship is less than 100 minutes long. However, intruder males can mate after a shorter courtship and avoid premature death if an earlier male had already exceeded this 100-minute threshold.

This could lead to lower quality males seeking out, rather than avoiding, competition with rival spider studs, the authors say.

For a longer story on this research, see http://go.nature.com/U6DPEG

K. JONES

ASTRONOMY

Galaxy size matters

Astrophys. J. **705,** 255–260 (2009)

A survey of distant galaxies shows that more loosely packed ones tend to form more stars.

The survey looked at 225 galaxies at distances of between about 2.8 and 3.4 parsecs from Earth. It found that compact galaxies tend to have fewer new stars than do their larger counterparts of comparative mass.

Sune Toft of the University of Copenhagen and his colleagues conclude that compact galaxies formed many stars quickly in one intense burst, early in the history of the Universe. Conversely, larger, more diffuse galaxies form stars gradually over a longer period of time. The results may explain why very distant galaxies are often more compact than the younger ones nearby.

JOURNAL CLUB

Jonathan Weissman
University of California, San Francisco

A biochemist looks at how DNA sequencing can reveal more than just sequences.

Huge advances in DNA sequencing have allowed us to readily determine the sequence of almost any living (and a few extinct) species. Yet arguably, most biological insight comes from work on five model organisms: *Escherichia coli*, baker's yeast, roundworms, fruitflies and mice. Unfortunately, many important biological processes are not captured in these creatures.

Papers from two groups, one led by Andrew Camilli of Tufts University in Boston, Massachusetts, the other by Brian Akerley at the University of Massachusetts in Worcester, describe new genetic tools that allow the quantitative dissection of gene function in a wide range of microorganisms (T. van Opijnen *et al. Nature Methods* **6,** 767–772; 2009; and J. D. Gawronski *et al. Proc. Natl Acad. Sci. USA* **106,** 16422–16427; 2009). These studies combine exhaustive transposon mutagenesis — whereby thousands of small DNA segments, or transposons, are introduced into the genome to mutate many genes — with massively parallel, or 'deep' sequencing of transposon/chromosome junctions to monitor the consequences of the loss of single or pairs of genes on the organisms' traits.

The real power of the approaches comes from the deep sequencing, which tracks the abundance of individual transposon mutants after they have been subjected to a stress. Knowing by how much each mutant has grown or suffered under the stress provides a measure of the relative roles that the mutated genes have.

I find it particularly gratifying that the advances in deep sequencing that have allowed us to catalogue so many genes from so many organisms can now be harnessed to help us figure out what these genes actually do.

Discuss this paper at **http://blogs.nature.com/nature/journalclub**