

RESEARCH HIGHLIGHTS

Blowing its top

Geophys. Res. Lett. **33**, L05313 (2006)

A newly identified type of ash-laden plume from volcanic eruptions may cause distant destruction, raising troubling issues for disaster planning.

A study of the 2002 Reventador eruption, 100 kilometres from Quito, Ecuador, found an unusual composition of steam and cool ash in the plume.

The plume could then unexpectedly deposit damaging pyroclastic ash flows far from the volcano.

Pinaki Chakraborty and his colleagues from the University of Illinois in Urbana-Champaign suggest that the scallop-shaped plume (pictured) of the Reventador eruption was caused by fluid instability from the negative buoyancy of plume materials.



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EVOLUTION

Under the spotlight

Science **311**, 1617–1621 (2006)

The molecular components of the lizard's third, or parietal, eye — a light-sensitive spot thought to sense changing light conditions — reveals something about how light detection evolved in the two familiar vertebrate eyes.

Working with side-blotched lizards (*Uta stansburiana*; pictured below), Chih-Ying Su and King-Wai Yau of the Johns Hopkins University in Baltimore, Maryland, and their colleagues identified one opsin protein most sensitive to blue light, and another most sensitive to green light, in the same cells of the third eye. The researchers show that the two proteins use different intermediary G proteins to respectively close and open ion channels in the cell.

This light-detection machinery may retain

more features from ancestral vertebrates than is seen in the rods and cones of modern vertebrate eyes, the authors propose.

CANCER

Deadly decisions

Cancer Cell **9**, 157–173 (2006)

High-grade gliomas (HGGs), a particularly aggressive type of brain tumour, are essentially incurable and kill most patients within months. Now Heidi Phillips at Genentech in South San Francisco, California, and her colleagues have identified genome-wide expression profiles and signalling pathways for a large cohort of HGGs, which may lead to more effective therapies for the disease.

Activating different signalling pathways that are crucial for controlling normal brain development gave rise to varied subtypes of HGGs — each with its own prognosis and disease progression, the researchers found.

Interestingly, the subtypes of tumours have gene-expression profiles of cells at various stages of development. This suggests that tumour growth might be regulated by mechanisms that regulate cell-fate decisions during neurogenesis.

BIOLOGY

Timing is everything

Curr. Biol. **16**, 512–515 (2006)

Wild hummingbirds can remember precisely where and when to find their food, a new study suggests.

Laboratory experiments indicate that some animals can learn short time intervals

between feedings. The new work, from Susan Healy of the University of Edinburgh, UK, and her colleagues, supports the notion that wild animals can do the same — specifically in their quest to find nectar.

In tests, rufous hummingbirds (*Selasphorus rufus*) learned to distinguish between a set of four flowers that were refilled with sugar solution 10 minutes after being emptied, and another set of four that were refilled 20 minutes after being emptied. The birds' timing ability is more detailed than previously thought, the researchers write.

IMMUNOLOGY

Not-so-innocent bystander

J. Exp. Med. doi:10.1084/jem.20052056 (2006)

Once thought to have only a role in autoimmunity, natural regulatory T cells do double duty by influencing immune responses to both self and foreign antigens, researchers have found.

Yasmine Belkaid, of the National Institute of Allergy and Infectious Diseases in Bethesda, Maryland, and her colleagues infected mice with the parasite *Leishmania major*. They found that natural regulatory T cells replicated rapidly at the primary infection site and attacked the microbe but not the mouse. These cells also contribute to the bystander effect, in which other immune cells in the area are suppressed, thus complicating infection control.

Regulation of this effect could lead to improved vaccines for diseases such as cancer, AIDS and malaria, where these cells have been found to play a part.