interacting chemically with several amino acids that are conserved across the two enzyme classes. Variations in a 'gatekeeper' amino acid apparently prevented the inhibitors acting on other kinds of kinase.

MOLECULAR BIOLOGY

It's all in the timing

Cell Stem Cell **3,** 364–366 (2008)

Researchers at Mount Sinai School of Medicine in New York suggest that collecting cells for bone marrow transplantation should be done in the evening. They base this recommendation on the finding that humans typically have more blood stem cells in their circulating blood late in the day than at other times.

In February, the team, led by Paul Frenette, reported that circadian clock genes influence the movement of blood stem cells between the bone marrow and the blood in mice. Blood stem cells in humans, they now find, also show these rhythmic fluctuations, although at opposite times of day from mice.

The quotidian pattern of stem-cell levels in the blood was not disrupted in the bones of donors who were injected with a drug called AMD3100 that mobilizes blood stem cells out of the bone marrow. So, the authors reason, harvesting cells in the evening might be the best way to maximize the number collected for transplantation.

NEUROBIOLOGY

Empowering the middleman

Proc. Natl Acad. Sci. USA doi:10.1073/pnas.0806114105 (2008)

Expressing a light-sensitive protein in cells that normally mediate between the retina and the brain restores a degree of vision in blind mice.

Retinal ganglion cells transmit signals that they receive from rod and cone cells to several regions of the brain. Rods and cones are the eye's main photoreceptors, and loss of these cells — a result of a number of human diseases — causes blindness.

Ordinarily, only a small subset of retinal ganglion cells contains the photosensitive pigment melanopsin. Richard Masland of Massachusetts General Hospital in Boston and his colleagues used a virus to induce widespread melanopsin expression within these cells in mice with degenerated photoreceptors. The treatment allowed the animals to respond to light and dark.

The finding adds to previous research that manipulated another type of 'middleman' retinal cell into expressing a light-sensitive bacterial protein, channelrhodopsin-2.

GEOSCIENCES

Peatering out

Nature Geosci. doi: 10.1038/ngeo331 (2008)

If Earth were suddenly to warm by 4 °C, peatlands would lose 40% of the soil organic carbon from their shallow parts and 86% from their deep parts over about 700 years. Takeshi Ise of the Japan Agency for Marine-Earth Science and Technology in Yokohama and his colleagues make this prediction after building a model that incorporates peat chemistry, soil hydrology and, for the first time, thermal dynamics.

Peat is subject to positive feedback. The more it rains, the higher the water table, and the more oxygen-depleted the peat becomes, which lowers the decomposition rates of soil organic carbon. And the more soil organic carbon peat has, the better it retains water. Raising the temperature increases decomposition rates, so causing this feedback loop to run in reverse.

P. GOETGHELUCK

PARASITOLOGY

Hopping mad

Anim. Behav. doi:10.1016/j.anbehav.2008.07.018 (2008)

A parasitic hairworm that infects crickets and causes them to 'commit suicide' by drowning (pictured above) somehow prompts its host to develop a death wish at exactly the right time. That is, when the hairworm (*Paragordius tricuspidatus*) is sexually mature and its host's timely demise in a watery grave enables it to reproduce.

Marta Sanchez at the Centre for Evolutionary and Functional Ecology in Montpellier, France, and her colleagues have broken down the crickets' change of behaviour into two stages. They compared infected and uninfected crickets (*Nemobius sylvestris*) collected from both their native dry forest habitat and from bizarre locations such as car parks. Uninfected crickets do not stray from their natural environment; however, not all of those found in foregin territories were suicidal at the time of collection.

It seems that, as the hairworm matures, it initiates erratic behaviour in crickets, causing errant wanderings. It then triggers suicide when it is reproductively ready.

JOURNAL CLUB

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A molecular biologist considers the corollary of misbehaving ion channels.

More than half a century ago, Hodgkin and Huxley hypothesized that pore-forming proteins found in a cell membrane could regulate the flow of ions across that membrane. These days, we classify ion channels according to the ions they allow through and the nature of the pore-forming protein. The crucial part of a pore is the protein's alpha subunit, which lines the pore. Auxiliary subunits, denoted by other letters of the Greek alphabet, merely tweak a channel's characteristics.

The basics infer an assumption: that different channels can interact with each other, but that subunits buried within a channel are 'married' to that channel 'for life'. A voltage-activated calcium channel can, for instance, form a pair with a large-conductance calcium-activated potassium channel. But a beta subunit of the calcium channel can associate only with the calcium channel's main alpha subunit, and a beta subunit of the potassium channel remains 'faithful' to the alpha subunit that surrounds the potassium pore.

However, assumptions should always be tested. In this case, Shengwei Zou and his colleagues at the University of Houston in Texas have taken the potassium channel in this example and shown that it is bound by an auxiliary beta-1 subunit of an L-type calcium channel ($Ca_v\beta1$). When this subunit interacts with the potassium pore, it alters both the pore's kinetics and calcium sensitivity (S. Zou *et al. Mol. Pharmacol.* **73,** 369–378; 2008).

I view this finding as part of an emerging theme, the ramifications of which could be profound. Ion channels may, in general, be much more dynamic structures than is currently recognized. This means that when researchers monitor a channel's activity they may not be recording exactly what they think they are — and that targeting ion channels with new drugs could produce unexpected side effects.

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