

SCORECARD

Saving the planet
NASA's planetary protection officer, John Rummel, is leaving. His two main tasks: protecting other planets from contamination by us, and protecting us from alien life. Seems he had a perfect record.

Golden age

Entrepreneur Peter Thiel has pledged US\$3.5 million to researcher Aubrey de Grey to pursue his theory that people can live indefinitely. But de Grey reckons he needs \$1 billion.

ZOO NEWS

Cosy penguins

Up to 2,000 fibreglass igloos are being built to house endangered penguins on Dyer Island in South Africa. But it's not ice the birds are missing — it's guano. The penguins use it for nests, but since the 1970s humans have been harvesting it for fertilizer.

Chainsaw reaction

In February, a US agency announced that it was mapping the habitat of an endangered woodpecker around Boiling Spring Lakes in North Carolina. The move could subject areas of the town to more stringent building restrictions. Landowners have responded by felling thousands of trees to drive the woodpecker out.

ON THE RECORD

"It won't stop until some of these scientists are dead."

Climatologist James Hansen sees a slow end to climate scepticism.

NUMBER CRUNCH

14 shuttle flights are needed in the next four years to finish the International Space Station.

19 shuttle flights were achieved in the four years between 1988 and 1991, when NASA also had three operational shuttles.

3 shuttle flights have taken place in the past three years.

Sources: *San Francisco Chronicle, Planet Ark, The New York Times*

Bad Boys question received wisdom on HIV

HIV is a frustrating foe, but at least doctors have been able to count on a few solid principles to help them fight the virus. Now, a group of scientists calling itself 'The Bad Boys of Cleveland' reports evidence that rebels against one of those principles. The findings cement a feeling that has been growing in the HIV research community: that the virus enlists patients' own defences to dismantle their immune systems.

This revises the picture first painted a decade ago, when studies reported that levels of HIV in a patient's blood predict how fast the patient will lose vital T cells. Since then, doctors have believed that the virus is the main trigger for T-cell loss. They rely on measurements of viral load to help them decide when and how to treat patients with HIV.

But it is increasingly clear that virus levels are only a small part of the story. In fact, as Benigno Rodriguez of Case Western Reserve University in Cleveland reports this week, viral load explains only 4–6% of the rate at which a

patient's T cells disappear (B. Rodriguez *et al. J. Am. Med. Assoc.* **296**, 1498–1506; 2006).

Rodriguez and his collaborators in California, Massachusetts and Washington examined blood samples from thousands of patients dating from 1984. They analysed the patients' viral load and T-cell count before treatment with antiretroviral drugs. The group found that, in general, patients with higher viral loads lost their T cells faster than those with lower virus levels. But the disease progressed at different rates in patients with similar viral loads. This suggests that something other than virus levels alone is driving T-cell loss.

Now, scientists must find out what that is. Many suspect that a phenomenon called immune activation is an important factor. This is the idea that HIV whips the body's immune system into a frenzy, and that this flurry of activity eventually triggers T-cell death. "This paper will help shift the focus of basic research to immune activation," says immunologist Zvi Grossman of the US National Institutes of

"We've been doing this on a shoestring — people pay their own air fare. They come because they like the atmosphere."

Mouse brain map is complete

Three years, 21,000 genes and US\$41 million after the Allen Brain Atlas was begun, it is finished. A three-dimensional map of gene expression in the mouse brain, the atlas is the most comprehensive study of its kind to date.

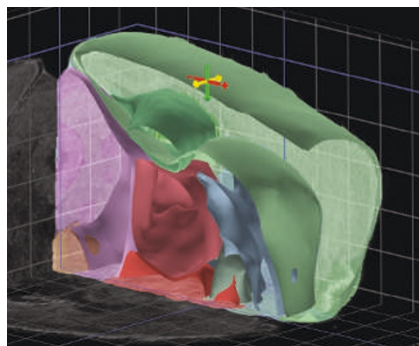
A personal interest in neuroscience saw Paul Allen, the billionaire philanthropist who co-founded Microsoft, establish the Allen Institute for Brain Science in Seattle, Washington, in 2001. He donated \$100 million: half went on the Brain Atlas, launched in 2003 as the institute's first major project after two years of consultation.

Researchers mapped where each of the mouse

brain's 21,000 genes are expressed by staining brain sections with probes specific to each gene. The resulting atlas provides insight into the brain's function, helping researchers understand how different regions operate and interact. Allan Jones, chief

scientific officer at the Allen Institute, is confident that the atlas will "dramatically propel neuroscience forwards".

The atlas is available free of charge online in the form of a database. Users can search for particular genes, then scroll through



Computer-generated cutaway of a mouse brain from Allen Brain Atlas data.

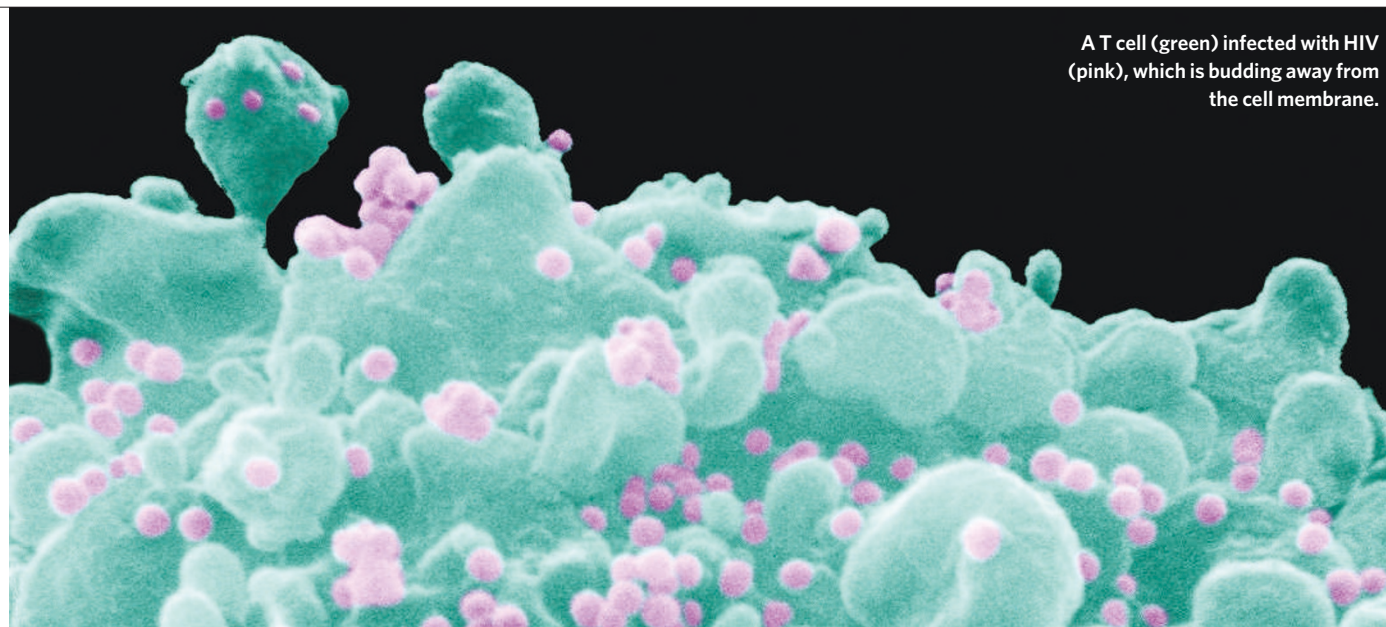
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A T cell (green) infected with HIV (pink), which is budding away from the cell membrane.

Health in Bethesda, Maryland.

The paper is also a score for the Bad Boys — a group of immunologists who have been meeting informally over the past two years. They include about 30 scientists, including Grossman, of whom a handful are 'Bad Girls'.

The Bad Boys were first convened by Michael Lederman, head of the Case Western Reserve University Center for AIDS Research and senior author of the recent paper. "The idea was to have a relaxed but intense forum where

we could present our unpublished data, share ideas, then go back to our lives and work some more," Lederman says. "We've been doing this on a shoestring — people pay their own air fare. They come because they like the atmosphere in which we work."

Many see that informal approach as a more refreshing form of collaboration than the large, top-down structures fashionable in HIV research these days (see *Nature* 442, 610–611; 2006). But in their fight against orthodoxy, the

Bad Boys have made one concession to scientific propriety. The *Journal of the American Medical Association* paper is the first to reference the Bad Boys, but it acknowledges the group by a much blander name: the Cleveland Immunopathogenesis Consortium. Lederman admits that the wordy title "lacks panache" compared with the Bad Boys nickname. But, he says: "We were anxious that editors might give us grief." ■

Erika Check

photographs of vertical or horizontal sections to see how expression is distributed. The completed atlas contains around 85 million images and 600 terabytes of data — enough to fill more than 7,500 top-of-the-range iPods.

The mice used in the Allen Brain Atlas were all 56 days old. An alternative project, the Gene Expression Nervous System Atlas (GENSAT), launched by the US National Institutes of Health in 2003, is mapping gene expression in the mouse brain throughout development. The project has begun to publish results but is still some way from completion.

Much of the Allen Brain Atlas information was released before the project was completed, and researchers in the field already seem pleased with the resource. According to the Allen Institute for

Brain Science, 250 scientists are using the atlas each day, and it is turning up in citations. "Combining the classical approaches of brain research with this new genetic approach is a breakthrough in neuroscience," says Susumu Tonegawa, director of the Picower Center for Learning and Memory at the Massachusetts Institute of Technology. "It's an extremely powerful approach to try to understand the brain."

"This will likely become the reference atlas for molecular and cellular neuroscientists," adds Thomas Insel, director of the National Institute of Mental Health in Bethesda, Maryland. He says the atlas has already produced two surprising results: "First, the percentage of genes expressed

in the adult brain is greater than we had expected, and second, the regional distribution is more selective than expected."

Alongside data on gene expression, the atlas provides an anatomical map of the mouse brain. Charles Watson is an expert on

"It's fantastic that someone has invested so much money in neuroscience."

brain mapping, currently working with George Paxinos to produce the sixth edition of *The Rat Brain in Stereotaxic Coordinates* — one of the most cited texts in the field. "The project is doing a really good thing and it's fantastic that someone has invested so much money in neuroscience," he says.

But Watson notes that the makers of the mouse atlas have chosen a different set of abbreviations from those in Paxinos' books. "We have the

lingua franca and they're refusing to use it, which seems a bit silly," he says.

Mice are an important model species in neuroscience research, due in part to their potential for genetic manipulation and drug testing not possible in humans. A corresponding atlas of the human brain is an obvious next step, however, and the Allen Institute has initiated pilot studies towards this end. "We plan to address key questions about the human brain and will be focusing our internal research efforts on understanding the cortex — the part of the brain associated with 'higher order' functions," says Jones. ■

David Brill
Nature has a commercial collaboration with the Allen Brain Institute in the Neuroscience Gateway.
► www.brainatlas.org/aba