

ON THE RECORD

“Unprotected sex with an infected individual is high risk regardless of whether the act is intended for procreation or recreation.”

Robert May, outgoing president of London's Royal Society, explains why the Vatican's ban on condom use encourages the spread of HIV.

“We are biologists and computer scientists, and what we do is just math. Math can't hurt you.”

Michele DeHart, head of the Fish Passage Center which, until recently, monitored salmon migration. Congress cut the centre's funding amid accusations that the institute was using data to promote an environmental agenda.

Sources: *The Age*, *Washington Post*

SCORECARD

Little penguins
A Tasmanian conservation group has collected 15,000 tiny sweaters to help protect the world's smallest penguins from future oil spills.

Toucan beaks
A study at the University of California, San Diego, has found that the bird's beaks are remarkably well designed and could be used as models for stronger, safer car components.

Intelligent design class
The University of Kansas has cancelled a course on intelligent design after the professor teaching it made disparaging comments about Christian conservatives, calling them “fundies”.

NUMBER CRUNCH

114 deaths per million people occurred in road crashes in 29 countries in the developed world during 2001.

0.293 deaths per million people were caused by terrorism each year in the same countries in 1994–2003.

390:1 is the ratio of road deaths to deaths from terrorism.

Source: *N. Wilson and G. Thomson Injury Prevention* 11, 332–333 (2005).

LEE JAE-WON/REUTERS/CORBIS

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REASONS

Embattled: doubt has been cast on the validity of some of Woo Suk Hwang's work on human embryonic stem cells.

TV tests call into question cloner's stem-cell success

Woo Suk Hwang, the cloning researcher who last month admitted lying about the origins of human eggs used in his work, now faces questions about the validity of his scientific data.

In May, Hwang's team at the Seoul National University in South Korea reported it had established 11 embryonic stem-cell lines derived from the skin cells of patients (W. S. Hwang *et al. Science* 308, 1777–1783; 2005). The experiment was hailed as a huge step towards the use of patient-specific cell lines in medicine. But Hwang has since sent *Science* two significant corrections to the published article.

And in a news programme on 1 December, the Seoul-based Munhwa Broadcasting Company (MBC) challenged the credibility of Hwang's data. Pursuing a tip-off, MBC procured from Hwang samples of five of the patient-specific cell lines and sent them, together with corresponding tissue samples, to an independent lab for DNA analysis. The programme reported that the DNA in one cell line did not match the tissue sample — as it should, if the lines were truly cloned from patient samples. DNA from four other cell lines could not be isolated.

According to Korean press reports, Hwang stands by the integrity of his science, but has yet to authorize independent tests, which could clear his scientific results.

There are many explanations for MBC's findings, such as improper matching of tissue and cell lines or contamination, says cloning expert Norio Nakatsuji of Kyoto University, Japan. But the DNA mismatch raises the possibility that existing or newly created embryonic stem-cell lines were substituted. “There would be no way to know from the paper whether the data were true or not,” he admits.

Donald Kennedy, *Science's* editor-in-chief says that the journal is looking “very carefully into the history of this paper”, but warns against overreaction. “At the moment there is no reason to believe that any of this affects the scientific conclusions in the paper,” he says.

Last month, Hwang corrected a table in the original paper showing that all of the cells had passed a test to see whether they can divide into various cell types — a hallmark of embryonic stem cells. In fact, only three of the eleven lines had passed this test. And on 5 December, he notified *Science* that some images of stained cells, which supposedly represent different cell lines, were duplicates.

Alan Colman, chief executive of ES Cell International in Singapore and a member of the team that cloned Dolly the sheep, says it could all be down to “auditing error”. But some of the data are still very confusing, he adds.

Gerald Schatten, a co-author on the paper who is based at the University of Pittsburgh, has distanced himself from the article. *Science* has made an addition to the paper's supplementary information that describes the role of the University of Pittsburgh authors as limited to “the review and analysis of anonymized data and assistance in the preparation of this manuscript”. Although Schatten halted his collaboration with Hwang last month, he has stated that he believes the paper's conclusions are valid.

The confusion could easily be cleared up, says Colman, who organized an independent DNA analysis when sceptics raised doubts over the cells used to clone Dolly. “We were offended by allegations ranging from incompetence to fraud, but responded by clearing it up,” he says.

David Cyranoski