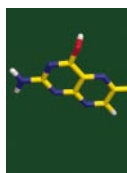




Sound bites
Study tracks
sophisticated views
on transgenics
p368



Name game
Chemists seek a
route from structure
to a proper name
p369



DNA clampdown
UK commission calls
for bar on illicit use
of DNA samples
p370



Killer question
US and Canada
clash over orphaned
orca
p372

Bell Labs launches inquiry into allegations of data duplication

Geoff Brumfiel, Washington

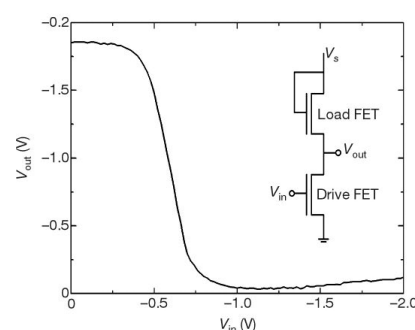
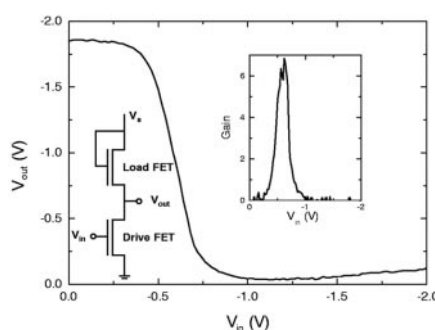
One of nanotechnology's rising stars is under investigation following claims that data in some of his papers have been falsified.

Jan Hendrik Schön, a researcher at Bell Labs in Murray Hill, New Jersey, faces an independent inquiry after scientists noticed striking similarities between different graphs in a number of his published papers.

Schön denies the allegations, but if they are upheld, many researchers are worried about the damage that could be done to basic research activities at Bell Labs, perhaps the world's best-known industrial laboratory. In addition, some fear that the allegations will taint nanotechnology's hot reputation.

The incessant drive towards miniaturization in electronics is a major theme of Schön's research. In particular, his work on using organic molecules deposited in thin films as molecular switches is viewed by many as a possible way to beat the size constraints imposed by silicon-based technologies.

The allegations against Schön first surfaced late last month after Lydia Sohn, who works on nanoscale electronics at Princeton University in New Jersey, received a tip-off from colleagues at Bell Labs. Sohn compared the graphs that make up Figure 4 in two separate papers published in *Science*¹ and *Nature*², and found the plots to be identical, right down to the random noise generated by the experiments (see above).



Double vision: similar graphs in *Science* (left) and *Nature* led some researchers to question the data.

Sohn notified the journals of the duplication, and they in turn requested that Schön provide clarification. He said that he had mistakenly sent the wrong figure to one of the journals and offered to write a correction.

Echoes from the past

That might have been the end of the matter had not one of Sohn's colleagues, Paul McEuen of Cornell University in New York state, made an unsettling discovery. "I was just looking at some of Schön's old papers and noticed a third similar figure," says McEuen. This graph was in a *Science* paper on a different type of microelectronic device³. The data were not identical to the first two, but portions of the graph matched perfectly.

A more extensive search by Sohn,

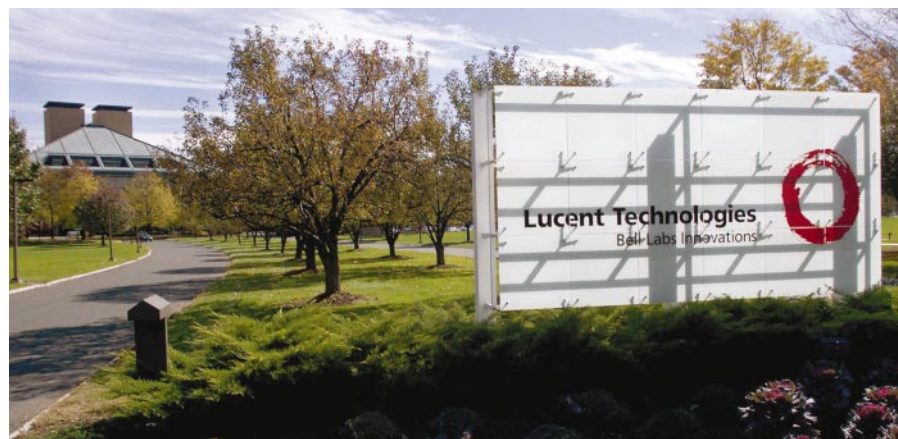
McEuen and others turned up a total of eight figures in six papers that appear to contain suspect data, the researchers say. In one case, two graphs look identical except for inverted scales, says Charles Lieber, a chemist at Harvard University. Lieber has examined all six of the papers under investigation, which include two others in *Science*^{4,5} and one in *Applied Physics Letters*⁶.

Senior officials at Bell Labs wrote to all the journals involved on 16 May saying that they had convened a special review committee, chaired by physicist Malcolm Beasley of Stanford University in California, to investigate the suspect figures. The investigation comes at a bad time for Bell Labs, as the financial difficulties of its parent company, telecommunications firm Lucent Technologies, have put pressure on the labs' research activities.

"We take concerns of scientific honour very seriously," says Cherry Murray, Bell Labs' senior vice-president of physical-sciences research, adding that Schön will be allowed to continue his work at Murray Hill until the review is completed. "We certainly don't want to rush to judgement," she says. Beasley hopes to complete the review by the end of the summer.

Nature will await the panel's findings before considering whether the authors should be asked to modify or retract the papers, says its editor, Philip Campbell.

Schön stands by his results. "I am confident in the measurements that I have taken and the experimental results, and I've tried to report them as best as I could," he says. Although he declines to comment on specific



Bell Labs at Murray Hill: launching an independent investigation into published nanotechnology results.



Rising star: Jan Hendrik Schön's impressive results have secured him several awards.

▶ allegations, Schön says that he is cooperating fully with the review committee. "I'm collaborating with my colleagues to reproduce these results and show them to the committee," he says. "I am trying to focus on the science."

At 31 years old, Schön is seen as one of the most able young physicists in nanotechnology. In the six years since he got his PhD at the University of Konstanz in Germany, he has produced over 100 papers and claimed several patents, as well as winning awards for his work in both the United States and Germany.

The speed and scope of his findings have aroused admiration among researchers — but some of his results have proved hard to reproduce. Robert Dynes at the University of California, San Diego, for example, has tried to replicate some of Schön's results for molecular switches that are turned on and off when an electric field is applied.

"I was fascinated by the results and frustrated that I couldn't reproduce them, and I didn't totally understand why I couldn't," recalls Dynes. The problem, he says, was that the applied electric field kept destroying critical components of the experiment.

Dynes is not alone. Groups at the French Atomic Energy Commission, Harvard University, Princeton and elsewhere say that they have so far been unable to reproduce some of Schön's results. ■

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Public ponders biotech issues

Quirin Schiermeier, Munich

European citizens hold more finely differentiated and balanced views on genetically modified foods than scientists and politicians give them credit for, says a study carried out for the European Commission.

False interpretations of what the public wants are largely responsible for the difficulties faced by European policy-makers in managing agricultural biotechnology, the study claims.

The study, *Public Perceptions of Agricultural Biotechnologies in Europe*, is based on an analysis of discussions held between 1998 and 2000 by 55 focus groups in Germany, France, Britain, Italy and Spain, as well as interviews with activists, scientists and others who are more directly involved with the agricultural biotechnology industry. It was coordinated by Brian Wynne, a sociologist at Lancaster University, UK, who established his reputation by using such methods to assess the public's perception of nuclear power in the 1980s.

"Almost all popular opinions on the alleged misperceptions about the alleged view of the 'man and woman on the street' turned out to be simply myths," the study says. "Participants did not, overall, express entrenched opinions 'for' or 'against' genetically modified organisms."

The researchers found that public mistrust of regulatory bodies such as food-safety agencies was the underlying basis of suspicions of agricultural biotechnology.

Better information will not, in itself, restore the public's trust in these regulators,

the study concludes. Instead, it says that "more profound changes in institutional culture and practice" will be required. It suggests imposing heavy sanctions on companies or research institutions if any harm is caused by new technologies.

But Derek Burke, a retired molecular biologist and former chairman of the UK Advisory Committee on Novel Food and Processes, is sceptical about the study's findings, saying that he is uneasy about both its tone and its content. Burke argues that focus groups can easily be led towards a desired conclusion.

"This is an interesting contribution from a group of people with strong views," says Burke. "But their arguments reflect no more than the current media coverage." ■

♦ www.pabe.net



Food for thought: the public's perceived opinions on genetic modification are open to question.

US 'overspent' on collider project

Geoff Brumfiel, Washington

The US National Science Foundation (NSF) is under fire over its financial management of major research projects — including its contribution to the Large Hadron Collider, the particle collider being built at CERN, the European particle-physics laboratory in Geneva.

An audit by the research agency's inspector general, Christine Boesz, found that the NSF failed to track properly the full costs of the projects. For example, the agency told the National Science Board, its governing body, that its contribution to detectors at the Large Hadron Collider would cost \$81 million. But, the audit says, a further \$57 million will be needed for advanced computing and maintenance if US scientists are to glean any data from the detectors.

"The inspector general's report has confirmed my fears that there is little

oversight of NSF's large facilities," says Senator Kit Bond (Republican, Missouri), the senior Republican on the Senate subcommittee that funds the NSF. At a hearing on 15 May, Bond nonetheless expressed his support for a plan that would see the NSF's budget double in size within five years (see *Nature* 417, 209; 2002).

NSF officials claim that the inspector general's report is misleading. Robert Eisenstein, who heads the NSF's Directorate of Mathematical and Physical Sciences, says that the \$81 million will be enough to complete the parts of the detectors that are specified by the NSF's agreement with CERN. "We will deliver exactly what we said we will deliver," he says. The proposed \$57 million will cover maintenance and computing technology that had not even been invented when the agreement was signed, says Eisenstein. ■