

Faked Research On Stem Cells Is Confirmed By Korean Panel

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The South Korean researcher Hwang Woo Suk faked results of at least 9 of 11 stem cell lines he claimed to have created, his university said Friday, in the first confirmation of allegations casting suspicion on his purported breakthroughs.

In a May paper in the journal *Science*, Dr. Hwang claimed to have created 11 stem cell lines matched to patients in an achievement that raised hopes of creating tailored therapies for diseases. But one of his former collaborators said last week that 9 of the 11 cell lines had been faked, prompting reviews by the journal and Seoul National University, where Dr. Hwang works.

In its first progress report on Friday, a panel at the university said it had found that "the laboratory data for 11 stem cell lines that were reported in the 2005 paper were all data made using two stem cell lines in total." The panel said DNA tests currently being performed would confirm if the remaining two stem cell lines had actually been successfully cloned from a patient.

To create fake DNA results purporting to show a match, the university said, Dr. Hwang's team split cells from one patient into two test tubes for the analysis -- rather than actually match cloned cells to a patient's original cells. "Based on these facts, the data in the 2005 *Science* paper cannot be some error from a simple mistake, but cannot be but seen as a deliberate fabrication to make it look like 11 stem cell lines using results from just 2," it said.

The panel said it would now also investigate Dr. Hwang's other landmark papers, which include another *Science* article in 2004 on the world's first cloned human embryos, and an August 2005 paper in the journal *Nature* on the first cloned dog.

Dr. Hwang has maintained his science is sound and that tests will prove his case. But he admitted last week to "fatal errors" in the May report and asked *Science* to withdraw the paper. He acknowledged that at the time of publication, his team had created only eight cell lines. But he said three more were created later.

The panel said Friday that it had found no records of two of the other stem cell lines Dr. Hwang claims to have created.

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Crumpled Papers

Lowering Expectations at Science's Frontier

By [NICHOLAS WADE](#)

THERE is considerable disorder in heaven when stem-cell scientists are chided by the Roman Catholic Church for the folly of pursuing "miracle cures." But such are the paradoxes generated by the implosion of a South Korean researcher's widely believed claims to have created human embryonic [stem cells](#) from patients.

Of course, miracles like the Shroud of Turin are also widely believed. But scientific claims are meant to belong to a different category of truth: They are the certified knowledge of a community of scholars who have rigorously tested their ideas through experiment and mutual criticism.

How then can the fraudulent claims by [Dr. Hwang Woo Suk](#) have been accepted by Science, a leading journal that rejects most papers submitted to it? How can the community of stem-cell scientists have allowed a very visible claim to have stood unchallenged in their field for 20 months? Little wonder that Richard Doerflinger, an official of the United States Conference of Catholic Bishops, ridiculed the dreams of therapeutic cloning in a statement last week, scoffing that scientists were chasing miracle cures "in pursuit of this mirage."

The contrast between the fallibility of Dr. Hwang's claims and the general solidity of scientific knowledge arises from the existence of two kinds of science - a distinction that is often blurred when new advances are reported first by scientific journals and then by the news media. There is textbook science and frontier science, and the two types carry quite different expiration dates.

Textbook science is material that has stood the test of time and can be largely relied upon. It may include findings made just a few years ago, but which have been reasonably well confirmed by other laboratories.

Science from the frontiers of knowledge, on the other hand, is wild, untamed and often either wrong or irrelevant to future research. A few years after they are published, most scientific papers are never cited again.

Scientific journals try to impose order on the turbulent flow of new claims by having expert reviewers assess their merit. But even at the best journals, reviewers provide only a rough screen. Many papers slip through that later turn out to be innocently wrong. A few, like Dr. Hwang's, are found to be fraudulent.

This rough screening serves a purpose. Tightening it up, in a vain attempt to produce instant textbook science, could retard the pace of scientific advance.

But the roughness of the proceedings is not prominently advertised by journal editors, except when cases of blatant fraud are detected, whereupon they proclaim that peer review cannot reasonably be expected to detect fraud. They do not protest so much when newspapers report their journals' claims as if they were certifiably true. Because of Science's authority, Dr. Hwang's claims to have cloned human embryonic cells were prominently reported and presented to the public as if they were important breakthroughs.

But any new advance belongs to frontier science, which is inherently fallible, and a journal's imprimatur, though worth something, is no guarantee of truth. An advance only becomes solid when other laboratories have confirmed it, by which time it is no longer news. This presents a serious problem for journalists: many scientific claims, including those in leading journals, turn out to be overstated or wrong, and science reporting that presents these journals' products as gospel is likely to be misleading.

Scientists and journal editors are, of course, well aware of the tentative nature of frontier science. As Donald Kennedy, the editor of Science, observed when the Hwang case first broke, journals often publish work that is innocently wrong. "The public needs to understand that the journals and peer review are not perfect," he said.

But last week Dr. Kennedy announced he was considering revising the journal's publication procedures, though not with any great hope of preventing future cases of fraud. He suggested that authors would be required to state in writing their specific contributions to a report, a reform perhaps aimed at Dr. Gerald Schatten of the University of Pittsburgh. Dr. Schatten accepted senior authorship of - and thus responsibility for - one of Dr. Hwang's papers, even though Dr. Schatten had performed none of the experiments and was not in a position to vouch for them. All the work was done in Seoul.

A second proposed change is to have all authors state that they agree with an article's conclusions.

Both procedures may seem to include a certain potential for generating strife. Each author could overstate his or her contribution, arousing the wrath of all the others. Some authors may think a conclusion too timid, while others consider it an overstatement.

But some medical journals, like The Journal of the American Medical Association, already require authors to state who did what. The system works very well, said Drummond Rennie, the journal's deputy editor and the instigator of the idea. Requiring authors to specify that they agree with the conclusions leads to conservative statements, a result that is also beneficial, in Dr. Rennie's view.

Tightening up the reviewing system may remove some faults but will not erase the inescapable gap between textbook science and frontier science. A more effective protection against being surprised by the likes of Dr. Hwang might be for journalists to recognize that journals like Science and Nature do not, and cannot, publish scientific truths. They publish roughly screened scientific claims, which may or may not turn out to be true.

