

Cloning Researcher Accused of Falsifying Evidence

BY Liz Townsend

Embryonic stem cell research proponents are reeling in the wake of allegations that their most prominent and celebrated researcher, South Korea's Hwang Woo-suk, fabricated evidence and violated fundamental scientific procedures, calling into question all of his reported breakthroughs that have provided some of the few "successes" in the field.

Hwang has admitted to lying about the source of human eggs used in his research, while experts are questioning his claims of creating the first stem cell lines from cloned embryos that genetically match their donors, the first cloned embryo, and the first cloned dog.

Hwang resigned as head of the World Stem Cell Hub and other government-funded stem cell research agencies November 24 after confirming that he used eggs donated by his research assistants, a violation of international research protocol.

The scandal has prompted some of the first negative reports about human cloning and embryo experimentation from the mainstream media. Accounts typically report any alleged "breakthroughs" in awe-filled tones, completely ignoring the immorality of creating designer human beings and then killing them for their stem cells.

The fall of an internationally known cloning researcher has shocked pro-cloning advocates, who attempted to distance themselves from Hwang while still touting the necessity for embryonic stem cell research. "Unfortunately, the damage Hwang did can't be undone," Robert Lanza of Advanced Cell Technology told the *Washington Post*. "It can't be undone for us, and it can't be undone for the thousands of people who may die in the future because this research has been unnecessarily held up while [Hwang] played his games and traveled around the world like a rock star."

A special panel convened by Seoul National University (SNU) to examine Hwang's research is expected to issue a final report around January 10. After that is completed, prosecutors say they will begin a criminal investigation into possible fraud or embezzlement charges, *Korea Times* reported. The national Bioethics Committee that advises South Korea's president is also investigating and plans to meet January 15, according to *Korea Herald*.

The allegations of fraud surround Hwang's May 2005 paper in the peer-reviewed journal *Science*, which concerned 11 stem cell lines culled from cloned embryos. The lines, Hwang and his co-authors claimed, matched the individual genetic make-up of the donors. This was said to show that the formerly theoretical notion of creating stem cells tailored to be used in individual patients was possible.

The bubble began to burst in November, when reports surfaced about ethical violations in Hwang's lab. He allegedly used the donated eggs of his own assistants and paid for eggs from other women, violating international research protocols, *Korea Times* reported.

But the controversy deepened. Scientists alleged on various web sites that the photos of the cell lines in *Science* looked like duplicates of ones used in other journal articles by Hwang's associates, according to the *New York Times*. A Seoul television station, *Munhwa Broadcasting Corp. (MBC)*, conducted its own independent testing of the cell lines, and found that at least one of the lines did not match the donor's DNA, the *Associated Press (AP)* reported.

After conducting DNA tests, the SNU panel announced December 29 that two of the stem cell lines were not derived from cloned embryos, but rather from embryos created in a fertility clinic, according to the

Post.

In addition, photographs of these two cell lines were duplicated to provide evidence for the nine other non-existent lines claimed by Hwang in his *Science* paper, the *Post* reported.

"Currently, we cannot find stem cells that have identical DNA with patients and Hwang's team does not have scientific data to prove they did harvest patient-specific stem cells," said Prof. Roe Jung-hye, SNU's researcher-in-chief and spokeswoman for the panel, *Korea Times* reported.

"We learned that the two cell lines from which Hwang fabricated photos of the other nine cells for the *Science* paper do not match the DNA of patients who contributed somatic cells," Roe added.

In light of this evidence, *Science* has asked Hwang and his 24 co-authors to sign a retraction of the May 2005 paper, editor Donald Kennedy said in a December 29 statement. "There is no question in our minds that the stem cell paper published 19 May 2005 by the journal *Science* needs to be retracted," Kennedy stated, according to the *New York Times*.

While scientists continue to examine the paper's veracity, the controversy about how Hwang obtained the eggs and how many he used for his experimentation has gained in strength. Researcher Park Eul-soon told *MBC* that Hwang forced her to donate her own eggs after she dropped a Petri dish containing other eggs in March 2003, according to *Agence France-Presse*.

Hwang also claimed that he used 242 eggs to clone the first human embryo in 2004 and 273 to clone the 11 alleged embryos in 2005. However, *MBC* reported that he actually used over 1,600 eggs from 86 women for both experiments, paying many of the women. The television station also claimed that 20% of the women experienced side effects from the egg extraction, which involves hormone injections and surgery under general anesthesia.

Hwang continues to deny wrongdoing, although he offered to resign his SNU professorship December 23, after the panel released its first preliminary report, according to the *Post*. The university refused to allow him to resign, telling him to wait for the final report and indicating that he could be expelled from academia, the *Post* reported.

However, Hwang told *Beopbo*, a Buddhist newspaper, that he believes the actual stem cell lines from cloned embryos were stolen and switched with other specimens. "It is certain that a switch was made and experts will be able to see this immediately," Hwang told the newspaper, according to the *Yonhap* news agency. "An investigation by prosecutors will only take about two days."

But embryonic stem cell proponents continue to distance themselves and their own research from Hwang. Gerald Schatten, a University of Pittsburgh scientist who signed on to Hwang's May 2005 *Science* paper as a "senior author" despite having no actual involvement in the research, broke off his association with Hwang in November after the initial egg donation scandal broke, according to *AP*.

Others bemoaned that the scandal will affect the public's perception of all embryonic stem cell researchers, especially those in South Korea. The country's government has poured millions of won (South Korean currency) into such research, investing the equivalent of about \$65 million into Hwang's experiments alone, according to the *New York Times*. The government also established the World Stem Cell Hub, which was intended to be the worldwide center of embryonic stem cell research, planning to spend \$15 million next year.

"It's an international fraud," Chung Hyung Min, director of the Stem Cell Therapy Research Institute at Pochon CHA University, told the *International Herald Tribune*. "Dr. Hwang will be gone, but we, the rest of South Korean stem cell researchers, wonder how we will ever recover our credibility, which collectively fell to the bottom."