The Trouble with Hwang: The Ethical and Scientific Problems of Therapeutic Cloning

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A world-recognized figure with the status of a rock star, heaped with honors and money by his government and even a stamp in his honor. Leader of a world empire, with fawning colleagues. Fractured international partnerships and hints of ethics violations. Admissions of ethical breaches, of deceit, of paying women for their services, and stories suggesting coercion of women subordinates. Adulating fans rushing to support their idol, threatening violence against those who’ve besmirched his character. A nation reeling, trying to save face, tempted to write its own ethics code to maintain its hero.

Plot for the next Hollywood thriller? Novel of intrigue centering on a renowned politician?

No. The true story of a scientist: Dr. Woo-suk Hwang, a leading researcher in cloning technology from South Korea. Starting in 1999 with the cloning of cows, Hwang became recognized leader on cloning and gained international attention as the first to produce cloned human embryos. He published his findings in 2004 and followed with a second publication in 2005 detailing how his laboratory produced cloned embryos from several patients, and increased the efficiency of the human cloning process ten-fold. In the summer of 2005, Hwang’s lab gained notoriety for being the only one to succeed in cloning a dog.
Because of the achievements, the South Korean government has showered Hwang with praise and money for his research, and scientists from around the world have made pilgrimages to his lab to work with him. In the summer of 2005 he announced that he was forming the World Stem Cell Hub, centered in South Korea, to clone human embryos and provide embryonic stem cells to researchers worldwide.

Cloning, a non-technical term for somatic cell nuclear transfer (SCNT), is accomplished by transferring the nucleus of a somatic cell (a body cell) into an egg that has had its chromosomes removed. The process creates a new one-celled embryo with the genetic constitution of the individual who donated the somatic cell. In other words, the new embryo is a genetic clone of the donor. The newly created embryo develops in the same manner as a fertilized embryo, and potentially can be implanted into a womb and gestated to birth (often termed reproductive cloning?). But the reason Hwang and others are working to perfect the technique is not to produce babies but to harvest the embryonic stem cells inside the embryo.

About 7 days after conception, the embryo resembles a hollow ball with some cells inside?embryonic stem cells. It is at this point that the embryo can be destroyed to get its embryonic stem cells for experiments, what has been termed therapeutic cloning?. Obviously, though, it’s not therapeutic for the embryo?which dies in the process. Theoretically these cells could match the patient who was cloned though experiments with animals show otherwise.

There are, however, many scientific and ethical problems with cloning. One key ethical issue is the fact that young embryos are destroyed in the process; embryonic stem cell research destroys a young life itself, whether the cells are taken from cloned or fertilized embryos. In the case of cloning, new embryos are created specifically as experiments, and destroyed in those experiments. Cloning thus creates a class of humans who exist only as a means to achieve the ends of others, a caste system of lesser humans for scientific sacrifice.

Some have argued that the ends justify the means, that the possibility of producing cells to treat the diseases of millions justifies the sacrifice of hundreds, thousands, or even millions of young human embryos. But this attitude coarsens us, nurturing a view that some humans are expendable, and cheapens all humanity. It is also still pie-in-the-sky, long on promise and short on evidence that embryonic stem cells and cloning will deliver the medical miracles that are often promised. In the meantime, thousands of patients have already benefited from adult stem cell and umbilical cord blood stem cell treatments (for a list of the diseases that cloning has promised to treat see the scoreboard and lists at the website of Do No Harm).

Another significant ethical and scientific problem with cloning is the tremendous number of human eggs required to produce just one cloned human embryo and harvest its cells. Cloning is an inefficient process. In Hwang’s first report of human cloning, 242 human eggs were required to get just a few surviving human embryos and one dish of cells. Even with his increased cloning efficiency reported in 2005, at least 10-20 human eggs were needed to get one human embryo and its embryonic stem cells. A simple math calculation shows that, even if the cloning technique could be used for patients, it would take an outrageous number of human eggs to treat all the promised conditions?treating the 17 million diabetes patients in the U.S. would require a minimum of 170-340 million human eggs, just for one condition in one nation.
Where will all of the eggs come from, and the women to provide them? Will women be paid to serve as egg factories on a global scale? The high hormone dosages and invasive surgery required to harvest eggs put the women at risk of health complications, including a 5% risk of life-threatening side-effects. Will they be told of the risk?

It is this aspect that finally led to Hwang’s downfall. Starting with Hwang’s human cloning report in 2004 there have been questions about where he got all of the human eggs for his cloning experiments. The unraveling began when an American scientist, Gerald Schatten of the University of Pittsburgh, severed his 20-month collaboration with Hwang, intimating that he had learned of serious ethical violations and that Hwang had lied about some aspects of the research. As the story unfolded, it turned out that some women were recruited as egg donors with cash payments, creating a “market” for human egg trade. Others, including a student in his own laboratory, donated their own eggs for the experiments. Having a subordinate donate to an experiment raises serious questions of potential coercion, since the professor has almost life or death power over a student or junior scientist.

After years of denials, Hwang finally admitted in a televised broadcast that he had used eggs from paid donors and from his own lab workers. “I am very sorry that I have to tell the public words that are too shameful and horrible,” Hwang said. He resigned his position as leader of the World Stem Cell Hub and some other positions, but planned to go back to work in his lab. He noted that “I am so ashamed. I will not attempt to justify what I did.”

Others have attempted to justify Hwang’s ethical lapses, noting that the motives of science are for the greater good, and need not always align with the views of general society. Hwang himself said that, “Being too focused on scientific development, I may not have seen all the ethical issues related to my research.” Others in the South Korean government said not to judge Eastern culture by Western standards. Supporters of Hwang rallied around him, to save face for the country, some threatening the South Korean television station that first broke the news of the cloning scandal.

Shouldn’t there be a global norm for ethical values? Several scientists as well as the journal Nature have called for this. As it happens, there is a global norm already espoused. The United Nations passed a declaration in March 2005 calling for a prohibition on all human embryo cloning. The normative value here is human life and human dignity, the inherent worth of all human beings should be defended no matter regardless of their nationality, ethnicity, gender, or stage of development.

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