

Congressional Hearings
March 7, 2006
House Government Reform Subcommittee on Criminal Justice,
Drug Policy and Human Resources -- Hearing on Stem Cell Research

Chairman Souder, Representative Waxman, and Members of the Committee, thank you for inviting me to testify today on exploitation, fraud, and ethical problems related to human embryo cloning and embryonic stem cell research.

My name is Diane Beeson. I am a medical sociologist and Professor Emerita of Sociology at California State University, East Bay. I received my PhD at the University of California, San Francisco (UCSF) and was a Pew Postdoctoral Research Fellow at UCSF's Institute for Health Policy Studies. I have a long-standing professional interest in reproductive genetics and have worked at UC Berkeley's Center for the Study of Social Change on several federally funded studies on the social implications of genetic technologies. I have also been a Visiting Fellow at Stanford University's Center for Bioethics and have served on many review committees for the Human Genome Research Institute's Ethical, Legal and Social Implications Research Program. I am currently an affiliated scholar with the Institute on Biotechnology and the Human Future at the Illinois Institute of Technology and the Chicago-Kent College of Law.

First, I would like to emphasize that I am a life-long supporter of women's abortion rights and I support embryonic stem cell research using embryos left over from IVF treatments. However, in 2004 when the California Stem Cell Initiative was placed on the ballot asking voters to authorize \$3 billion in state bonds for research that prioritized the development of human cloning technologies, I decided to speak publicly about my concerns and became a founder of the Pro-Choice Alliance Against Proposition 71.

Like many social scientists I have broad concerns related to the wisdom of developing cloning technologies. However, my comments today will focus on social and ethical problems created by the demand for human eggs needed in experimental cloning, a process also known as somatic cell nuclear transfer, or SCNT. Specifically, the concerns I will raise today are related to the exploitation of women necessary for the development of SCNT. These are the same problems that have been uncovered in the scandal surrounding Dr. Hwang's research and that we can expect to persist wherever SCNT is pursued.

Dr. Hwang Woo-suk's original claim to have successfully used SCNT to create a human embryo from which stem cells were extracted was first announced in February 2004. California was then in the early stages of a \$35 million political campaign and media blitz to assure voters that if they supported massive public funding of this research miracle cures would soon be available for an unlimited list of lethal disorders.

Initial reports indicated Hwang's team used 242 human eggs to create one embryo in 2004. Then in 2005 he claimed to have generated "11 patient-specific stem-cell lines with a success rate of 1 line for approximately every 20 oocytes."¹ This created the illusion that significant progress had been made in bringing down the number of eggs SCNT would require. It has now been revealed that Dr. Hwang used over 2000 eggs in his discredited research.² His failure to produce even one cloned embryo reminds us that we still do not know how many thousands, or possibly even millions of eggs it may require to perfect

¹ Snyder, E.Y. and J.F. Loring. Beyond Fraud—Stem-Cell Research Continues. *New England Journal of Medicine* 2006; Vol. 354, No. 4, pp. 321-324.

² Steinbrook, R. Egg Donation and Human Embryonic Stem Cell Research. *New England Journal of Medicine* 2006; Vol. 354, No. 4, pp. 324-326.

SCNT. Furthermore, it has become clear that payment, coercion, and lying were used to acquire the eggs that we were told many women were eager to donate.

Californians, influenced by irresponsibly inflated claims of imminent cures, reinforced by excitement over Hwang's fraudulent research successes, have already cast their votes to massively fund SCNT; but the public has yet to be adequately informed about the human costs of such research. Today I would like to make three points in that regard:

1. Egg extraction as currently practiced poses inadequately understood, yet clearly significant, risks to the health of women.
2. Under current conditions informed consent to participate in egg extraction for research purposes is not possible.
3. The same social conditions that drive the demand for women's eggs set the stage for other violations of the public trust.

In light of this situation, I support the call for a moratorium on SCNT. This is a position supported by the feminist pro-choice women's health organization, Our Bodies Ourselves, the California Nurses Association,³ and many other pro-choice progressives.

To explain my position, let me begin with a brief background on egg extraction. Because such practices have come into expanded use since the birth of the nation's first test tube baby in December 1981, it is widely assumed that they have been proven to be safe. Unfortunately, this is not the case.

Extraction of multiple eggs involves both ovarian suppression and what is known as "ovarian hyperstimulation" using powerful hormones into a woman's body to manipulate it into producing many—often a dozen or more—eggs at a time rather than the normal one or two. The mature eggs are then collected for use in infertility treatments, in vitro fertilization, or research.

Contrary to common assumptions, these procedures have not been adequately studied. For example, one drug commonly used in egg extraction, Lupron, has not been approved for this purpose, but rather is used off label. Another such drug, Antigon, has been approved for such use, but no data are available on its long-term safety.⁴

As Suzanne Parisian, former Chief Medical Officer of the Food and Drug Administration, explains, "Pharmaceutical firms have not been required by either the government or physicians to collect safety data for IVF drugs regarding risk of cancer or other serious health conditions despite the drugs having been available in the United States for several decades."⁵

³ See Appendix A. California Nurses Association Position Statement on Embryonic Stem Cell Research.

⁴ See Appendix B. Letter from Dr. Suzanne Parisian, Former Chief Medical Officer, FDA. Also on-line at http://www.genetics-and-society.org/resources/items/200502_letter_parisian.html.

⁵ See Appendix B.

The FDA currently has on file over 6000 complaints regarding Lupron, including 25 reported deaths.⁶ These complaints must be investigated and analyzed.

In the absence of long-term follow-up it is impossible to assess accurately the seriousness of the risks to women's health from the expanding use of egg extraction. One study reports that up to 14 percent of patients undergoing ovarian hyperstimulation experience some form of ovarian hyperstimulation syndrome, or OHSS.⁷ This is a condition whose pathophysiology remains unclear. Common symptoms of mild OHSS include abdominal discomfort, ovarian enlargement, nausea and vomiting. Those who develop severe OHSS may experience a wide range of serious conditions including loss of future fertility, kidney or multiple organ failure, and death. The frequency of severe OHSS is estimated to be as high as 10 per cent of women who undergo the procedure.⁸

We don't yet know the full extent of the damage to the health of the Korean women who provided the eggs used by Dr. Hwang. But we do know that a coalition of 35 women's groups is suing the South Korean government on behalf of women who have been harmed in the process of egg extraction. Reports are that about 20 percent of the donors have experienced side-effects.⁹ We also know that serious problems with egg extraction are not unique to the Korean experience.

Jacqueline Rushton, who died as a direct result of OHSS in Dublin, Ireland, in 2003, suffered a gradual deterioration of her organs, virtually all of which were slowly destroyed.¹⁰ Temilola Akinbolagbe, a young woman who died last April in London, suffered a more sudden death from a massive heart attack linked directly to OHSS.¹¹

While such events seem to be rare, it is possible that many deaths and other longer-term side effects of ovarian hyperstimulation have simply not been linked officially to the egg extraction procedures that preceded them. For example, Dr. Parisian reminds us that "studies to date have not ruled out a possible link between stimulation drugs and increased risk of ovarian cancer." She concludes that it is very likely that "those promoting SCNT research may be unknowingly tackling a far more costly and serious health burden by allowing the expanded use of current IVF stimulation drugs for SCNT."¹²

One of most destructive consequences of ovarian hyperstimulation for women may be serious abnormalities in their children. Just this month a new study reports that ovarian hyperstimulation treatment in mice results in several significant abnormalities in their later offspring. These effects include growth retardation, a delay in ossification (bone development) and an eight-fold increase in a significant rib deformity. This particular deformity in humans is associated with an increased incidence of abnormalities and cancer. Because of these associations, the authors conclude that it is possible that their

⁶ Lazar, Kay. Wonder Drug for Men Alleged to Cause Harm in Women. *Boston Herald*, August 22, 1999.

⁷ Hugues, in Vayena, E. *et al.* (eds). *Current Practices and Controversies in Assisted Reproduction*. World Health Organization, Geneva, Switzerland, pp 102-125 (2002).

⁸ Magnus, D. and M.K. Cho. Issues in Oocyte Donation for Stem Cell Research. *Scienceexpress/www.scienceexpress.org* May 19, 2005, p.1.

⁹ Hwa-young, Ova Donors Demand Compensation from Government. *AsiaNews.it*. 2-7-2006. www.asianews.it/view_p.php?1=en&art=5322

¹⁰ See Appendix C. Letter from Rushton's mother. Mrs. Angela Hickey.

¹¹ Woman died after starting IVF treatment. *Richmond & Twickenham Times*. 20 April 2005. <http://www.richmondandtwickenhamtimes.co.uk/mayor/other/display.var.589076.0.0.php>

¹² See Appendix B

findings may have implications for the use of ovarian hyperstimulation treatments in women. This question must be answered before involving thousands of women in ovarian hyperstimulation purely for research purposes.¹³

Scientists and other proponents of SCNT have been reluctant to confront forthrightly the dangers related to egg extraction. This reluctance has been demonstrated repeatedly in recent California politics. For example, during the campaign to pass Proposition 71 its proponents took legal action in an effort to prevent opponents from explaining in the state Voters' Guide that the measure involved human embryo cloning, requiring thousands of women's eggs.¹⁴

Although efforts to keep this information out of the Voters' Guide failed, the heavily funded campaign nevertheless successfully undermined broader public dialogue on this issue. It did so by incorrectly characterizing all opposition to the measure as motivated primarily by concern with the moral status of the embryo. To the very limited extent that the term "cloning" entered the discussion, it was invariably inaccurately termed "therapeutic cloning," in spite of the fact that no therapies have yet been associated with SCNT. It was not until the election was over that the press began to raise many of the ethical problems implicit in the initiative.

A series of recent legal developments have fueled scientists' reluctance to confront ethical difficulties with SCNT. In 1980, the U.S. Supreme Court, in *Chakrabarty v. Diamond*, affirmed a right to patent genetically engineered life forms.¹⁵ In the same year, Congress passed the Bayh-Dole Act, which allowed universities and their researchers to patent even those research products funded by the federal government.¹⁶ As a result, the field of embryonic stem cell research has become the focus of a virtual biotech gold rush, inevitably creating gross conflicts of interest.

These conflicts of interest have been built into the structure of the newly established California Institute of Regenerative Medicine (CIRM). For example, at least half of its inaccurately named governing board (Independent Citizen's Oversight Committee [ICOC]) represent institutions likely to conduct stem cell research. In addition, at least seven of the 29 ICOC members have significant business relationships, including substantial equity investments and board memberships, with companies involved in stem cell research.¹⁷

¹³ Steigenga, MJ, et al. Evolutionary Conserved Structures as Indicators of Medical Risk: Increased Incidence of Cervical Ribs After Ovarian Hyperstimulation in Mice. *Animal Biology*, vol 56, No. 1, pp. 63-68 (2006). See Appendix D for full text.

¹⁴ Memorandum of Points and Authorities in Support of Petition for Writ of Mandate and Alternative Writ of Mandate/Order to Show Cause. (7-28-04, Case No. 04C501015) Paul Berg, Robert Klein, and Larry Goldstein, Petitioners vs. Kevin Shelly, Secretary of State of California, Respondent, Geoff Brandt, State Printer; Bill Lockyer, Attorney General of California ; Tom McClintock; H. Rex Green; John M. W. Moorlach; Judy Norsigian; Francine Coeytaux; Tina Stevens; Does I through X, inclusive, Real Parties In Interest. See also Declaration of Dr. Stuart A. Newman, PhD. In Opposition to Petition for Writ of Mandate and alternative Writ of Mandate/Order to Show Cause.

¹⁵ 447 U.S. 303(1980).

¹⁶ For the Bayh-Dole legislation see, Government Patent Policy Act of 1980, Pub. L. No. 96-517, 94 Stat. 3019.

¹⁷ Reynolds and Darnovsky, Reynolds, J. and M. Darnovsky, et al. *The California Stem Cell Program at One Year: A Progress Report*. Center For Genetics and Society. January 2006, p 26.
<http://www.genetics-and-society.org>

California's Stem Cell Initiative campaign illustrates how the need to secure massive amounts of funding has led advocates to obscure major scientific and technical obstacles to the research. These include difficulties in restricting the potential of embryonic stem cells to desired differentiated types, as well as their tendency to form tumors in adult hosts.¹⁸

Disclosures to women who are being asked to take significant risks to their health and fertility by making altruistic donations of eggs should not be limited to acknowledging potential negative consequences to the donor's health. They should also reveal the researchers' intent to develop patents using these donated eggs and the potential of these patents to harm the public health and to impede other research. These problems with patenting have been described in detail by Andrews.¹⁹

Until financial conflicts of interest are brought under control we can expect the pursuit of profit to trump humanitarian concerns in determining the directions science takes. We also can expect continuing challenges to established ethical norms. The conflicts of interest and pressures that existed for Dr. Hwang and his colleagues, two of whom were American, are not unique to Korea. They operate very strongly within the borders of the United States as well.

Some liberal and progressive supporters of stem cell research who are concerned with preventing these abuses have argued that what is needed is "public sector bodies with the power to establish and enforce comprehensive regulations that apply to both publicly and privately funded research."²⁰ They call for prohibitions on payments to egg providers except for out-of-pocket expenses to prevent the emergence of a market in eggs, a requirement that egg extraction be carried out by those not involved in stem cell research, and follow-up medical care to treat adverse reactions that women who provide eggs suffer.

However, due to rampant conflicts of interest among those involved in the field, I have serious doubts that any regulatory structure could avoid implicitly condoning SCNT, and therefore it would be ineffective in protecting women's health. Proposed regulations are particularly silent on the long-term threats to the health of egg providers, for which researchers must be held responsible.

As a society we are at a turning point in our relationship to science. We are being asked to make women the servants of biotechnology, rather than insisting on a biotechnology that promotes the well-being of all people. For these reasons, until we understand more fully its human costs, I strongly urge your support for a moratorium on SCNT.

¹⁸ Newman, S. A. (2003). Averting the Clone Age: Prospects and Perils of Human Developmental Gene Manipulation. *J. Cont. Health Law and Policy* 19, 431-463.

¹⁹ See Appendix E. Andrews, L.B. "Genes and Patent Policy: Rethinking Intellectual Property Rights." *Nature Reviews/Genetics*, Vol. 3, October 2002.

²⁰ Reynolds, J. and M. Darnovsky, et al. The California Stem Cell Program at One Year: A Progress Report. Center For Genetics and Society. January 2006, p 17. www.genetics-and-society.org