Testimony of Richard M. Doerflinger

before the

Senate Finance Committee
Maryland General Assembly

In support of Senate Bill 362
“Human Cloning Prohibition Act of 2007”

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I have been asked by the Maryland Catholic Conference to submit written testimony on Senate Bill 362. I am familiar with this kind of legislation on human cloning, because I have testified before Congress on several occasions in support of an almost identical federal bill.

In support of SB 362

SB 362, a genuine and much-needed ban on human cloning, is almost identical to S. 658 in the 109th Congress, sponsored by Senators Sam Brownback (R-KS), Mary Landrieu (D-LA) and 30 others. This kind of cloning ban has been overwhelmingly approved twice by the U.S. House of Representatives and endorsed by President Bush, and similar laws are in effect in five states. It would ban the use in humans of the cloning procedure known as “somatic cell nuclear transfer” (SCNT) -- the technique used to make “Dolly” the sheep, and more recently used in South Korea in an attempt to make human embryos for research.

Recent developments in Korea lend extra urgency to this legislation. Researchers led by Dr. Woo-Suk Hwang, the only scientists in the world to convince the scientific community that they had cloned human embryos and derived embryonic stem cells from them, are now seen as having perpetrated a massive fraud. The team solicited over two hundred women (often with cash incentives), and even pressured female researchers, to provide human eggs for cloning experiments, at serious risk to the women’s health; from over two thousand eggs the researchers failed to produce even one stem cell line despite hundreds of cloning attempts; and they covered up their failure by falsifying two major articles in a prestigious U.S. science journal. News media accurately reported that this means “the highly touted field of embryonic stem cell research is

1 Arkansas, Indiana, Michigan, North Dakota and South Dakota. Virginia’s law may also be interpreted as a complete ban on human cloning.
years behind where scientists thought it was.” Yet U.S. cloning researchers are more determined than ever to prove that “therapeutic cloning” can work – even if it means exploiting many more women for eggs, and creating and destroying many more thousands of human embryos, to try to make that happen.

Such efforts are underway now at Harvard University, and at Advanced Cell Technology in Worcester, Massachusetts -- though these researchers have found even the initial step of recruiting women for risky egg donation to be almost impossible, because they are not permitted to offer cash payments to the women undergoing these risks.

SB 362 should be supported by anyone who truly wants to prevent human cloning. It bans the human cloning procedure explicitly and precisely, without affecting any other area of stem cell research or any use of cloning techniques to make plants, animals, genes, or cells other than human embryos.

Human cloning should be banned because it shows grave disrespect for human beings in the very act of creating them. It reduces human procreation to an assembly line, where fellow humans are manufactured to preset specifications and exploited for the sake of traits deemed useful by others.

Some may ask: Isn’t human cloning already prohibited by the “stem cell research act” the General Assembly approved last year? The answer, unfortunately, is no. SB 144, now Chapter 19 of the Maryland code, prohibited only “the replication of a human being” by using any cloning process “in order to create a new human being or to allow development beyond an embryo.” The key terms “embryo” and “human being” were left undefined, leaving the ban hopelessly ambiguous. For example, in some usages “embryo” is used only for the very earliest stages of human development, while many medical textbooks use it to refer to the developing human in the first eight weeks of development. “Human being” may mean any and all stages of human development (but that would contradict the law’s reference to going “beyond an embryo”), or it may be intended to cover only the born human being (but then it seems one may in fact develop the cloned human well past the embryonic stage as long as this does not produce a live newborn child).

Note also that the key step in attempting to produce live-born cloned infants (called by some “reproductive cloning”) is not prohibited at all by Chapter 19. That is, as long as the cloning technique itself was not performed in order to “replicate” a later-stage human being, anyone afterward may simply place the cloned embryo in a woman’s womb and attempt a live

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birth without violating the law. Thus all the key steps in cloning for research as well as cloning for reproduction would seem to be permitted. In any event, the key terms are so undefined that any attempt at prosecution would likely face a constitutional challenge for vagueness.

The incoherence of Chapter 19 is symptomatic of the efforts by many to articulate a fundamental difference between “reproductive” cloning (cloning for baby-making) and so-called “therapeutic” cloning (cloning for research purposes). The problem is that there is no objective difference between the two, because the cloning procedure is identical in both cases – the only difference lying in what the researcher may want to do with the cloned human embryo after the cloning procedure has been performed. He may want to place embryos in wombs for an attempt at live birth, or he may want to keep the embryos in a Petri dish and destroy them for stem cells or other research goals. But these later acts do not change the degree to which the embryo was “cloned.”

In any case, as numerous supporters of “therapeutic” cloning now admit, the two uses cannot be separated in reality: If you allow and encourage cloning for research purposes, you will facilitate so-called “reproductive” cloning as well. In the words of Dr. Hwang himself, “this technique cannot be separated from reproductive people cloning…”

The professional association for our nation’s fertility specialists agrees:

“Researchers have proposed using SCNT [somatic cell nuclear transfer] to generate embryonic stem cells for persons who need tissue or organ transplants... If undertaken, the development of SCNT for such therapeutic purposes, in which embryos are not transferred for pregnancy, is likely to produce knowledge that could be used to achieve reproductive SCNT.”

Or in the words of researchers at Advanced Cell Technology in Massachusetts, pioneers in pursuing “therapeutic cloning”: “It is true that the techniques developed in CRNT research can prepare the way scientifically and technically for efforts at reproductive cloning.”

In terms of disrespect for life, the difference between the two uses of cloning is this: Judging from animal trials, efforts to grow cloned humans in a womb will lead to their deaths 90


5 The Ethics Committee of the American Society for Reproductive Medicine, “Human Somatic Cell Nuclear Transfer (Cloning),” 74 Fertility and Sterility 873-6 (November 2000) at 873. This article’s title also acknowledges “cloning” and “somatic cell nuclear transfer” to be one and the same thing – any claim that one can ban cloning, while allowing SCNT, is scientific nonsense.

6 Robert Lanza, et al, “The Ethical Validity of Using Nuclear Transfer in Human Transplantation,” 284 Journal of the American Medical Association 3175-9 (December 2000) at 3178. (The authors use their own invented term, “cell replacement by means of nuclear transfer” or “CRNT,” to describe the SCNT cloning procedure.)
to 95% of the time, through "accidental" miscarriage and stillbirth; efforts to use them for research will lead to their deaths 100% of the time, through deliberate destruction. Clearly the latter use of cloning, where humans are made solely to be exploited and destroyed, is an even greater threat to human dignity than the former.

Some state and federal lawmakers have proposed allowing (and sometimes even funding) the mass-production of human embryos by cloning, while prohibiting efforts to implant a cloned human embryo in a uterus (or even efforts to bring a cloned human to live birth). But these unacceptable proposals would define a class of developing members of the human race that it is a crime not to destroy — a set of human beings who are forbidden to exist, except as objects of research. That approach is gravely wrong on moral grounds. It could only be implemented by having the government mandate the destruction of cloned embryos — or even mandate forced abortions, in cases where a cloned embryo has already implanted in a woman's womb. The moral, practical and even constitutional problems in such an approach should be clear.7

The slippery slope of "therapeutic" cloning

Some scientists and others oppose legislation like SB 362, arguing that embryonic stem cells obtained from cloned human embryos is essential for progress against devastating diseases. They propose cloning human embryos from patients with these diseases, then destroying the embryos for their stem cells, claiming that such cells would be genetically matched to the original patient and therefore not rejected as foreign tissue.

Yet, even aside from the grave ethical violation involved in creating members of the human species solely to destroy them, the fact is that such "therapeutic cloning" using embryonic stem cells is not working well, even in animals. These embryonic cells are too difficult to maintain, too uncontrollable, too genetically unstable, too likely to form lethal tumors in animals' bodies, to be of any use for human therapies. Moreover, for reasons researchers still do not fully

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7 Commenting on efforts to ban the transfer of cloned embryos to women's wombs (without banning reproduction by in vitro fertilization), the U.S. Department of Justice notes that "the transfer of an embryo to initiate a clinical pregnancy is presumably the same regardless of whether the embryo involved was originally produced by cloning or fertilization. Hence, there is no visible difference between the prohibited activity and the permitted activity, both of which would presumably be conducted within the privacy of a hospital or medical office. Entrusted with enforcing such a limited ban, law enforcement would be in the unenviable position of having to impose new and unprecedented scrutiny over doctors in fertility clinics and/or research facilities to ensure that only fertilized embryos were being transferred to would-be mothers." Regarding efforts to prevent only the production of live-born cloned children, the Department observed that "except in those exceedingly rare instances when the parties involved announced their intention to engage in unlawful activity in advance, it is difficult to envision how law enforcement officials could effectuate the stated goals ...of preventing the birth of cloned infants. For example, once a pregnancy were established, any government-directed attempt to terminate a cloned embryo in utero would create problems enormous and complex." Statement of U.S. assistant attorney general Daniel J. Bryant before the House Government Reform Committee, May 15, 2002, at www.cloninginformation.org/congressional_testimony/bryant_02-05-15.htm. In short, if you want to ban human cloning at all, the effective way to do so is to ban the use of cloning to make human embryos in the first place.
understand, even genetically matched cells derived from cloned embryos can still be rejected as foreign tissue when placed in animals’ bodies. 8

Especially disturbing are several recent studies indicating that cells derived from cloning will not be “therapeutic,” unless cloned embryos are developed to the fetal or even newborn stage for cell harvesting. This has been reflected in some proposed state legislation authorizing human cloning for research purposes. Legislation enacted in 2003 in New Jersey with the support of the national Biotechnology Industry Organization, for example, allows cloned human embryos to be implanted in women’s wombs (or in animal or artificial wombs) as long as they are not allowed to survive through the “fetal and newborn” stages to produce a new live-born individual. 9 Such “fetus farming” proposals are the grotesque but logically consistent result when hypothetical “progress” is allowed to trump all principles of medical ethics and common decency.

At least four scientific studies help to explain why biotechnology companies and their allies feel it is now necessary to pursue such grisly excesses:

In the first study, designed to provide new kidney tissue, researchers found that they had to gestate cloned cow embryos in a uterus and then abort them for their fetal kidney tissue to achieve success. 10

The second study, designed to correct a genetically-based immune deficiency in mice, required taking the new mouse (produced by cloning and genetic modification) to the newborn stage and harvesting its adult stem cells to treat the original mouse. 11

A third study, published in a journal of the American Heart Association, found that cloned mice had to be grown to the fetal stage and then aborted to provide usable cells, this time

8 Regarding one such attempt at “therapeutic cloning,” stem cell experts at the NIH said one of the study’s “unexpected findings” was the fact that stem cells from cloned embryos are “rejected by the hosts” after being transplanted despite having “the same genetic background” as they do. They noted that specialized cells derived from embryos (even cloned embryos) may be subtly different from naturally produced adult cells in ways that interfere with their therapeutic use. See R. Tsai et al., “Plasticity, Niches, and the Use of Stem Cells,” 2 Developmental Cell 707-12 (June 2002) at 710.


10 R. Lanza et al., “Generation of histocompatible tissues using nuclear transplantation,” 20 Nature Biotechnology 689-96 (July 2002). The authors wrote then: “Because the cloned cells were derived from early-stage fetuses, this approach is not an example of therapeutic cloning and would not be undertaken in humans.” Id. at 689.

for attempted repair of heart damage in mice.\textsuperscript{12}

The fourth study helps explain the results of the other three: It finds that the cloning process wreaks havoc with gene expression in the developing human, because it tries to reprogram all the genes of a specialized body cell to become active again at one time, to make a new human being. This problem is worst at the embryonic stage, dimming the prospects for any safe or “therapeutic” use of embryonic cells. If the cloned embryo can be made to survive into the fetal stage, however, there is a second opportunity to complete this gene reprogramming and smooth out the gene expression errors.\textsuperscript{13}

Therefore, embryonic stem cells from cloning may well be incapable of safe and effective use in human patients. Yet attempts to move beyond the embryonic stage to “farm” fetuses for their body parts would require horrendous exploitation of developing children.

That project would require the further exploitation of women as well. As noted above, any version of “therapeutic” cloning requires that women be subjected to dangerous fertility drugs to produce many eggs at once for the enormously inefficient cloning procedure. For “fetus farming” attempts, they will also have to be exploited as human incubators, to help develop cloned embryos to the point where usable cells and tissues can be “harvested.”

Fortunately, Congress acted last year to prevent this grotesque abuse by unanimously approving the “Fetus Farming Prohibition Act” (Public Law 109-242, signed by President Bush July 19, 2006). This law provides federal criminal penalties for anyone who makes use of fetal cells or tissue (including stem cells) that he knows was produced by deliberately gestating a human unborn child to provide this tissue. Also prohibited was the use of cells or tissue from a human unborn child who was gestated in the uterus of a “nonhuman animal.”

But with the avenue of “fetus farming” closed off, researchers are left with little evidence that “therapeutic cloning” can become a workable model for producing therapies. Efforts to use cloning to produce useful human embryonic stem cells remain mired in failure and fraud.\textsuperscript{14} And

\textsuperscript{12} Robert Lanza et al., “Regeneration of the Infarcted Heart With Stem Cells Derived by Nuclear Transplantation,” \textit{Circulation Research} 94 (April 2, 2004): 820-827. The cloned mice had to be developed to the equivalent of the fifth to sixth month of human fetal development, then aborted for their cells. “Cleaved (2-cell) embryos were transferred... to the oviducts of pseudopregnant CD1 surrogate mothers. Cloned fetuses recovered at 11 to 13 days of gestation were used as source of liver cells.” Online Data Supplement, at http://circres.ahajournals.org/cgi/data/94/6/820/DC1/1. Total gestational period in the mouse is about 20 days long.

\textsuperscript{13} See J. Fulka et al., “Do cloned mammals skip a reprogramming step?”, in 22 \textit{Nature Biotechnology} 25-26 (January 2004) (concluding that this poses serious problems for both “reproductive” and “therapeutic” cloning).

\textsuperscript{14} The journal \textit{Science}, of course, has completely retracted Dr. Hwang’s two fraudulent articles claiming success in human embryo cloning. Last summer another prestigious journal, \textit{The New England Journal of Medicine}, had to admit that its article of a year before, proclaiming “progress in human somatic-cell nuclear transfer,” mischaracterized two studies in other journals by claiming that they showed benefits in animals from stem cells derived from “nuclear transfer” (cloned) human embryos. As the editors now admit, the studies actually used stem
yet it seems researchers will keep trying to exploit women for their eggs, and keep trying to mass-produce cloned embryos for their research, unless society stops them.

“Therapeutic” cloning: Useless and unnecessary for therapies?

Supporters of human cloning for research purposes sometimes claim that this procedure is needed for progress in treating conditions such as Parkinson’s disease, Alzheimer’s disease, juvenile diabetes and cancer.

Such claims were dealt a serious blow in 2004 by one of the world’s leading experts on cloning, Dr. Ian Wilmut (leader of the Scottish team that cloned “Dolly” the sheep). He wrote in the British Medical Journal:

“In any treatment regime we must avoid immunological rejection of the transferred cells, but the immune response is likely to vary from one disease to another... [I]n the treatment of diseases within the central nervous system cells from cloned embryos seem likely to offer less advantage as fetal cells in the central nervous system appear not to be subject to rejection. Finally, several of the conditions that are mentioned as candidates for cell therapy are autoimmune diseases, including type 1 diabetes. In such cases transfer of immunologically identical cells to a patient is expected to induce the same rejection.”

In other words, cloning is probably unnecessary for any condition involving the central nervous system such as Parkinson’s and Alzheimer’s -- because that system does not have a strong immune response, but will accept cells from genetically unmatched sources. I would add that this is true not only for fetal cells but adult cells as well. And cloning is useless for autoimmune diseases such as juvenile (Type 1) diabetes, because the cells from a cloned embryo would have exactly the same genetic makeup that makes the diabetic patient’s faulty immune system reject his or her cells in the first place. With this one paragraph, Dr. Wilmut dismissed the direct “therapeutic” use of cloning for the vast majority of conditions cited by its supporters.


In fact, after more than two decades of research using mouse embryonic stem cells, researchers have yet to find a reliable way to direct these cells to form pancreatic cells that can reverse juvenile diabetes in mice, let alone human beings. One recent study, for example, found that past attempts to differentiate these cells in the right direction failed to produce the “beta cells” needed for diabetes treatments. The cells did produce some insulin, but not in response to changes in surrounding glucose levels; and when placed in diabetic mice they did not reverse diabetes but only formed teratomas (tumors).\(^{17}\)

Now Dr. Wilmott and others want to clone human embryos, not to provide therapies, but to \textit{increase} the number of desperately sick humans in the world. They want to clone these embryos from people with devastating diseases, so the embryos themselves (or the stem cells obtained by killing them) will provide “models” for better understanding these diseases.\(^{18}\) But it is speculation at best to think that a stem cell line from an embryo will somehow duplicate the process of disease development in a human body. And if the embryo itself is the “model,” the temptation will no doubt prove irresistible for some researchers to develop the embryo to later and later stages to find when the disease first begins to manifest itself. And so we will be back on the slippery slope to “fetus farming” and beyond, this time beginning with the creation of new humans precisely in order to watch them sicken and die.

Fortunately, advances in stem cell research \textit{are} bringing us much closer to a cure for juvenile diabetes and spinal cord injury, and are already being used in clinical trials to reduce or cure Parkinson’s disease, multiple sclerosis, leukemia, sickle-cell anemia, bone damage, heart damage, and dozens of other ailments. But these advances are coming from stem cells from adult tissue, umbilical cord blood, and other sources—avenues that create no moral problem, and certainly do not involve any form of human cloning.\(^{19}\)

\section*{Conclusion}

There is one legally and morally responsible way to ban human cloning, and that is to ban the use of the cloning procedure to create humans in the first place. At least five states, and 23 countries,\(^{20}\) have genuine laws against human cloning, and the United Nations recently urged all

\(^{17}\)See S. Sipione et al., “Insulin expressing cells from differentiated embryonic stem cells are not beta cells,” 47 \textit{Diabetologia} 499-508 (March 2004).


\(^{19}\)See: the advances reported at www.stemcellresearch.org; “Disorders and Conditions Treated with Non-Embryonic Stem Cells” (compiled from the NIH database and the National Marrow Donor Program), \textit{Congressional Record}, September 9, 2004, at H6956-7; Cord Blood Registry, “Diseases Treated with Stem Cells,” at www.cordblood.com/cord_blood_banking_with_cbr/banking/diseases_treated.asp.

nations "to prohibit all forms of human cloning inasmuch as they are incompatible with human
dignity and the protection of human life."\textsuperscript{21} I urge Maryland to follow their lead by enacting SB
362. Such a ban is necessary to stop irresponsible researchers from using cloning for unethical
experimentation and for reproduction -- and it will not stop or interrupt medical progress toward
the cure of devastating diseases. Rather, it will help direct the research enterprise toward
promising therapies that all of us can live with.

\textsuperscript{21} UN press release, “General Assembly Adopts United Nations Declaration on Human Cloning by Vote of 84-34-