

## CLONING

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*Webster's Unabridged Dictionary* describes *cloning* as, "The technique of producing a genetically identical duplicate of an organism by replacing the nucleus of an unfertilized ovum with the nucleus of a body cell from the organism." Dr. Harold Shapiro, president of Princeton University and head of the National Bioethics Advisory Commission, pointed out that extensive research in cloning, which he refers to as "somatic cell nuclear transfer" has been going on for over forty years. Genetic engineering became important in 1973 when segments of DNA could be separated and then inserted into the ring of a host organism. The danger of man creating monstrosities resulted in several Asilomer conferences in which scientists sought to establish reasonable guidelines for research in these areas.

Dr. Floyd Bloom referred to past errors and successes at nuclear transfer with frogs, cells, embryos, and fetuses. These were accomplished with embryonic cells and not the nucleus from an adult cell. Robert Winston writing in the *British Medical Journal* pointed out, "Successful cloning was published in 1975 and it is over eight years since Prather *et al* published details of the first piglet clone after nuclear transfer." The announcement from the Roslin Institute in Scotland about Dolly, the sheep was different. This sheep was born on July 5, 1996, as a result of a nucleus from an adult cell being implanted in an enucleated ovum. This meant Dolly was different from previous experiments in that she had the genetic material of only one parent and was therefore "a delayed genetic twin of a single adult sheep."

There are substantial hurdles to consider from the physical view about projecting what has been done in sheep to what may be done in humans. Dr. Shapiro suggests these uncertainties include "the impact of genetic imprinting, the nature of currently unknown species differences, and the effects of cellular aging and mutations." In spite of these serious problems, Dr. Richard Seed, a physicist, announced his intentions to open a human cloning clinic within this year 1998. He also stated that he hopes to produce the first human clone by the middle of 1999. Dr. Seed is not medically qualified for work with humans; however, he has experience in reproductive genetics, and Dr. Deborah Josefson writing in the *British Medical Journal* states that he "was involved in introducing the process of in vitro embryo transfer from farm animals to humans." Public reaction against the thought of a Frankenstein-inclined scientist creating clones precipitated government action. President Clinton banned federal funding for research into human cloning and he suggested that Congress enact legislation forcing a moratorium on this type of research. Two bills have been introduced in the Senate addressing this problem, S. 1601 by Senator Frist, and S. 1602 by Senators Kennedy and Feinstein. Neither of these has been debated for vote. The National Bioethics Committee met in an emergency session after Dr. Seed's announcement where views varied from calling human cloning as "grossly unethical" to

the thought that it may be something to try out in the future, but “for scientific and ethical reasons, it is premature.”

Dr. Seed’s response was that if he were banned from opening a clinic in the United States, he would go to another country. He states that he has already made contacts with Mexican officials, but that he needs about 2 million dollars to open his clinic. He reports that he has four infertile couples who desire to have this procedure, and has a team of doctors and others to participate. His disregard for the moral issue is revealed in his position that “moral concerns were not enough to stop science....”

Dr. Mark Sauer, chief of reproductive endocrinology at Columbia Presbyterian Medical Center, addresses the possibility that human cloning can be accomplished. “There is no question that it can be done. The question is should it be done and under what conditions?” To produce Dolly as a viable clone, it took 277 attempts with the failures being discarded. Undoubtedly hundreds of human eggs will be needed; many will carry lethal mutations. Dr. Seed plans to screen cloned embryos for mutations and abort those with these defects. Dr. Seed’s purpose seems primarily to answer the problem for couples with intractable infertility. Dr. Robert Winston has suggested that it might be possible to generate many tissues to be used in transplants: “Cloning techniques might also be useful in developing transgenic animals—for example, for human xenotransplantation.” What he is saying is that human clones would be created for their body parts to be transplanted.

On July 25, 1997, a report was made available from the Roslin team that lambs had been produced containing human genes. The ethical implications are obvious, and in January 1998 an agreement was signed in Paris by 19 members of the Council of Europe to prohibit “any interventions seeking to create a human being genetically identical to any other human being, whether living or dead, by whatever means.” Germany and Great Britain claim to have preventive measures already in place, and they did not sign. Dr. Winston also points out that many of the animal clones had “serious developmental abnormalities.” This would indicate that we could anticipate the same problem with human involvement.

To complicate evaluation of this complex science, are the many false claims as well as the science-fiction atmosphere. The science writer David Rorvik gave a report of the first cloning of a human in 1978, which caused a great sensation. Films such as Ira Levin’s *The Boys from Brazil* exploited curiosity regarding cloning. Even recognized scientists such as Dr. Karl Ilmensee became embroiled in controversy about the validity of his work of nuclear transfer as it related to cloning. In fact the claims of Dolly being created from the transfer of an adult cell has been questioned. An article in *Nature*, February 26, 1998, raises the question of a stem cell being present since the donor sheep was lactating.

Are we content to leave the ethical issues in the hands of the scientists? Much has been written about the advantage of the clone research in combating infertility and certain diseases such as cystic fibrosis, hemophilia, and other genetics-related diseases. In the field of organ transplant we already have reports of the buying and use of body-parts. Dr. Zaki Shapiro, an Israeli surgeon, is reported to have transplanted kidneys purchased from poor Romanians. He did have to operate outside of Israel according to the article, but bills have been introduced in

Israel to allow the trafficking in body parts to be done there. Can we expect more restriction from scientists regarding cloning for body parts?

There is a need for continuing research in the use of genetic manipulation in alleviating suffering. Is there an ethical solution without promoting aborted human fetuses? Use of part of the placental tissue, the normal afterbirth, has been reported as far back as 1913. Recent studies at Vanderbilt University Medical School and the University of Miami School of Medicine have used the amniotic membrane from human placentas to promote corneal healing. Dr. Ming Wang further expanded his report of this research in an Amniotic Membrane Transplant talk.

The ultimate decision regarding these experiments should be the Word of God. Random genetic pooling is important, which is implied in Leviticus chapter 18 with prohibition against consanguineous marriages. The warnings from Leviticus 19:19 undoubtedly project the dangers of genetic manipulation of mankind, "Thou shalt not let thy cattle gender with a diverse kind; thou shalt not sow thy field with mingled seed; neither shall a garment mingled of linen and woolen come upon thee." May we realize the dangers of creating new species, of recreating the existing ones, and consequences of being our own Shepherd. As we think of sheep being cloned and similar plans being made for humans may we proclaim. "The Lord is my Shepherd: I shall not want."

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## **SOURCES**

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