

Testimony of  
**Dr. Irving L. Weissman**

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Madam Chair and members of the Committee. My name is Irv Weissman. I am a professor at Stanford Medical School, and my main research field for the last 20 years has been the biology and transplantation of adult stem cells in mice and humans. I am here as chair of the National Academies Panel on Scientific and Medical Aspects of Human Cloning, which released its report on January 18, 2002.

The charge to the panel in June 2001 was to examine the scientific and medical issues relevant to human reproductive cloning, including the protection of human subjects, and to clarify how human reproductive cloning differs from stem cell research. Our charge did not extend to an examination of the ethical issues related to human reproductive cloning.

We needed to determine whether current methods for reproductive cloning are scientifically feasible and reproducible and are medically safe. In addition, we needed to examine whether human participants in the process could be adequately advised and protected. Society and its leaders will need such scientific and medical information if they are to address the relevant ethical and public-policy issues.

In reproductive cloning, the nucleus of a body cell is transplanted into an egg whose nucleus had been removed, stimulating it to divide to produce a blastocyst embryo; the blastocyst is then placed into a uterus with the intent of creating a newborn.

In a related but different procedure, cells are isolated from a blastocyst derived by nuclear transplantation, and the cells are used to produce stem cell lines. This is shown in the figure. Such stem cells are unspecialized cells that can develop into almost all kinds of body cells. In what is sometimes called therapeutic cloning, the donor of a nucleus for transplantation to produce stem cells can be a person in whom stem cell daughter cells will be used to regenerate damaged tissues. There is another medical use for nuclear transplantation to produce stem cells; stem cells derived from a body cell or a disease cell of a patient who had inherited the risk for that disease could be powerful tools for medical research and lead to improved therapies.

We studied the scientific and medical literature and held a workshop with world leaders in the relevant technologies. Among the participants were persons who planned to clone human beings. The data from animal studies of reproductive cloning demonstrate that only a small percentage of the attempts are successful, that many of the resulting clones die during all stages of gestation, that newborn clones often are abnormal or die, and that the procedures carry serious risks for the mother. However, the data on nuclear transplantation to produce stem cells show that these cells are functional.

Given those findings, the panel unanimously approved the following recommendations

Human reproductive cloning should not now be practiced. It is dangerous and likely to fail. The panel therefore unanimously supports the proposal that there should be a legally enforceable ban on the practice of human reproductive cloning.

The scientific and medical considerations related to this ban should be reviewed within five years. The ban itself should be reconsidered only if at least two conditions are met: (1) a new scientific and medical review indicates that the procedures are likely to be safe and effective, and (2) a broad national dialogue on the societal, religious, and ethical issues suggests that a reconsideration of the ban is warranted.

Finally, the scientific and medical considerations that justify a ban on human reproductive cloning at this time are not applicable to nuclear transplantation to produce stem cells. Because of the considerable potential for developing new medical therapies for life-threatening diseases and advancing fundamental knowledge, the panel supports the conclusion of a recent National Academies report that recommended that biomedical research using nuclear transplantation to produce stem cells be permitted. A broad national dialogue on the societal, religious, and ethical issues is encouraged on this matter.

Scientists place high value on the freedom of inquiry--a freedom that underlies all forms of scientific and medical research. Recommending restriction of research is a serious matter, and the reasons for such a restriction must be compelling. In the case of human reproductive cloning, we are convinced that the potential dangers to the implanted fetus, to the newborn, and to the woman carrying the fetus constitute just such compelling reasons. In contrast, there are no scientific or medical reasons to ban nuclear transplantation to produce stem cells, and such a ban would certainly close avenues of promising scientific and medical research.

The panel stressed that all concerned segments of society should examine and debate the broad societal and ethical issues associated with human reproductive cloning, as well as those associated with nuclear transplantation to produce stem cells. We hope our report will help this Committee and President Bush's Council on Bioethics in this regard.

Thank you for the opportunity to testify. I hope that my statement and the panel report can be put into the record. I will be happy to answer questions.

#### ATTACHMENTS:

The National Academies Report: Scientific and Medical Aspects of Human Reproductive Cloning

Report Executive Summary

Report Press Release

FOR MORE INFORMATION: [www.nationalacademies.org](http://www.nationalacademies.org)