

**REPORT OF THE UNIVERSITY OF NEBRASKA
BIOETHICS ADVISORY COMMITTEE**

RECOMMENDATIONS FOR HUMAN STEM CELL RESEARCH

**Submitted to President L. Dennis Smith
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Background

On March 20, 2000, President L. Dennis Smith established the Nebraska Bioethics Advisory Committee (Committee), a broad based committee composed of academics and representatives of the public-at-large. He charged the Committee to consider and to advise him with regard to issues relating to biomedical research. The second of two issues that he asked the Committee to initially consider is the use of human stem cells in biomedical research. The Committee reviewed the myriad of scientific, legal, and ethical issues surrounding the conduct of such research. Two separate subcommittees of the Nebraska Bioethics Advisory Committee studied human stem cell research. The first studied legal and scientific issues; the second studied ethical issues. The subcommittees presented their findings to the Committee as a whole.

After further consideration and study, the Committee developed, reviewed, and adopted an initial set of tentative recommendations. These tentative recommendations were then published and a public hearing was scheduled for January 23, 2001, at the Hardin Center in Lincoln, Nebraska.

The Committee now proposes the following recommendations regarding human stem cell research. The recommendations are categorized as follows:

- a) The ethical acceptability of conducting research that involves either the derivation or use of human embryonic stem (ES) or human embryonic germ (EG) cells,
- b) The means of ensuring appropriate consent of the donor(s) of human embryos remaining after infertility treatments,
- c) The need for restrictions on the sale or donation of these materials and the designation of those who may benefit from their use, and
- d) The need for ethical oversight and review of research that involves either the derivation or use of human embryonic stem (ES) or human embryonic germ (EG) cells at the institutional level.

Introduction to the Science of Stem Cells

Basic Science

There are three general types of stem cells, each derived from different sources. They are:

1. Human adult stem cells (AS cells): These cells are found within the adult human and they can renew certain tissues. Current scientific practice does not know how to induce these differentiated AS cells (i.e., committed to a specific function) to develop into *any* specific cell type. However, there are promising recent reports of AS cells being transformed into new cell types and this suggests that it may be possible in the future to transform AS cells into any cell type.
2. Human embryonic stem cells (ES cells): These cells are found in the inner cell mass of a blastocyst-stage (less than 100 cells) human embryo. These cells are *pluripotent*, or capable

of developing into nearly any cell type in a human body and can divide extensively in culture. However, the human ES cell, by itself, could not develop into a human being. There are two main sources of human ES cells:

- Embryos created through in vitro fertilization (IVF) that remain after a completed infertility treatment. Consent to use these embryos is granted by the biological donors as an alternative to indefinite freezing or destruction through thawing; and
- Embryos created solely for research purposes using IVF.

In addition, human embryos produced using Somatic Cell Nuclear Transfer (SCNT) are also a potential source of ES cells. These cells are obtained after a human somatic cell (human body cell) is fused with an enucleated egg (egg without a nucleus) and a blastocyst is allowed to develop. This is the scientific process of cloning. Cells are obtained from the blastocyst in the same manner as ES cells. The area of greatest potential benefit of using such human ES cells is in the area of generating self-cells/tissues/organs that will not cause recipients to suffer rejection effects, since the transplants will be of their own cell types. However at this time, there is only one report of SCNT-produced human ES cells. This research was not subject to peer review in a scientific journal, and consequently, its accuracy is uncertain.

3. Embryonic germ cells (EG cells): These cells are obtained from cadaveric human fetal gonadal (primordial germ) tissue, generally after an elective abortion, with consent obtained from the woman undergoing the abortion. Human EG cells have properties similar to human ES cells, such as the ability to divide extensively in culture into many different types of cells, and thus these cells are also pluripotent.

Potential Medical Applications Using Stem Cells

There are several specific potential medical applications from research using stem cells. While the following list is presented in terms of human ES and EG cells, in the future human AS cells may also be manipulated to achieve the same ends. These applications include:

1. Human ES and EG Cells in Transplantation: Human ES cells developed through SCNT and other theoretical techniques have the potential to develop highly individualized treatment modalities and transplantable cells/tissues/organs from the patient's own somatic cells, avoiding the current immunological rejection problems associated with transplantation. Alternately, banks of multiple cell lines representing a spectrum of tissue types could be developed to alleviate the need for immunosuppressive drugs.
2. Transplantable Organs: Given the limited availability of transplant organs, use of human ES and human EG cells to create transplantable organs could provide a highly significant breakthrough for major organ transplantation. As with using human ES and human EG cells for tissue transplant, issues of organ rejection may be avoided by developing organs that are not seen as "foreign" by the body's immune system. In addition, this technique could be useful in treating children with congenital organ malformations and people who have lost organs due to trauma or disease.

3. **Cancer Therapy:** Human ES and EG cells may be able to reduce tissue toxicity brought about by cancer chemotherapy. Currently, some patients undergo bone marrow transplants with their own bone marrow (adult) stem cells to restore their immune systems after high-dose chemotherapy. Unfortunately, these new bone marrow cells have limited ability to recognize abnormal cells, such as cancer cells. Injections of human ES or EG cells may revive the complete immune system in these patients.
4. **Nervous System Diseases:** Diseases that result from the loss of nerve cells, such as Parkinson's, Alzheimer's, Huntington's, multiple sclerosis, amyotrophic lateral sclerosis (Lou Gehrig's disease), brain and spinal cord injury and other neurodegenerative disorders, are currently the focus of much of the hope for the use of human ES and EG cells. Since mature nerve cells cannot divide to replace those that are lost, the ability to regenerate such cells through human ES and EG cell transplantation could provide effective therapies or cures for neurodegenerative diseases and neurological trauma.
5. **Bone and Cartilage Diseases:** Human ES and EG cells may provide effective treatments for such degenerative diseases as osteogenesis imperfecta (a genetic disorder that causes bone to be very brittle and subject to fracture), chondrodysplasias (a genetic disorder that causes bone to grow spurs at the growth plates which cause deformity), and osteoarthritis. Human ES and EG cells could be grown in culture and transplanted into the affected victim to effect long-term correction of the damage.
6. **Toxicity and Drug Testing:** Human ES and EG cells may be used to test drugs which could reduce and refine the clinical tests necessary to determine efficacious drug therapies. In addition, the effects of environmental toxins on developing embryonic and fetal development tissue systems could be studied using human ES and EG cells.

Legal Framework for Derivation and Use of Human Stem Cells

Federal law currently limits the use of Department of Health and Human Services (DHHS) funds for human embryo research. Specifically, DHHS funds cannot be used for the *derivation* of stem cells from human embryos. The Congressional restriction, however, does not prohibit federal funding of research *utilizing* ES cells because such cells are not human embryos. The National Institutes of Health (NIH) published *Guidelines for Research Using Human Pluripotent Stem Cells* in the *Federal Register* on August 25, 2000 (and reissued a corrected version in the November 21, 2000 *Register*). The *Guidelines* prescribe procedures to help insure that NIH-funded research using human ES and EG cells is conducted in an ethical and legal manner. Privately funded research involving the derivation of human ES cells from embryos and research using human ES or EG cells are not subject to either the Congressional restrictions or those contained in the *Guidelines*.

Donation of Excess IVF Embryos

After completing fertility treatments, couples may either:

1. Donate excess IVF embryos to other couples for implantation,
2. Indefinitely freeze the excess IVF embryos,
3. Allow the excess IVF embryos to be destroyed through a thawing process, or
4. Donate the excess IVF embryos for research purposes, including derivation of stem cells.

Even though the NIH does not permit federal funding to derive human ES cells from excess IVF embryos, NIH has adopted ethical constraints and conditions on the derivation of human ES cells from such embryos when, subsequently, such ES cells will subsequently be used in federally funded research. NIH adopted federal oversight mechanisms to ensure that:

1. A couple's or individual's decision to donate remaining embryos must be free from coercion or undue pressure;
2. Donors should not be able to designate or restrict recipients for research or therapy;
3. The demonstration of respect for embryos requires that it remain illegal to sell embryos;
4. Any research use of embryos or embryonic tissues from outside of the United States must satisfy all United States regulations pertaining to such derivation or use; and
5. Researchers must assure that the source of the cells was derived ethically and in compliance with the *Guidelines* .

Guidelines Governing NIH Funding for Human ES or EG Cell Research

Section III of the *Guidelines* does not permit NIH funding for the derivation of human ES cells or the following types of human ES cell research:

1. "Research in which human ES cells are utilized to create or contribute to a human embryo,
2. Research utilizing human ES cells that were derived from human embryos created for research purposes only,
3. Research in which human ES cells are derived using SCNT (cloning),
4. Research using human ES cells that were derived using SCNT,
5. Research in which human pluripotent stem cells are combined with an animal embryo, and
6. Research in which human pluripotent stem cells are derived using SCNT for the purpose of reproductive cloning of a human."

The *Guidelines* prescribe the documentation and assurances that must accompany requests for NIH funding for research using human ES or EG cells. The following requirements are included:

1. For research studies using human ES cells derived from human embryos, NIH funds may be used only if the cells were derived from frozen embryos that were created for the purposes of fertility treatment and were in excess of clinical need;

2. Inducements, monetary or otherwise, for the donation of the human embryo are prohibited. There must also be a clear separation between the fertility treatment and the decision to donate human embryos for research;
3. Investigators who propose to use human EG cells must follow both the *Guidelines* and all laws and regulations governing human fetal tissue and human fetal tissue transplantation research;
4. Informed consent must specify whether or not information that could identify the donor(s) will be retained;
5. Donation of human embryos or cadaveric fetal tissue must be made without any restriction regarding the individual(s) who may be the recipient of the human ES or EG cells;
6. The Institutional Review Board must approve derivation protocols;
7. The informed consent should include statements that the human embryos or cadaveric fetal tissue will be used to derive human ES or EG cells for research, that may include human transplantation research; that derived cells may be kept for many years; that the research is not intended to provide direct medical benefit to the donor; and that donated human embryos will not be transferred to another woman's uterus and will not survive the stem cell derivation process; and
8. The informed consent must also state the possibility that the results of the research may have commercial potential, and that the donor will not receive any benefits from any such future commercial development.

State and Other Federal Legal Considerations

There is no Nebraska law governing in vitro fertilization or the use of human embryonic tissue for research.

Federal regulations permit federally funded research using cells and tissues from aborted fetuses as long as such research is "conducted only in accordance with any applicable state or local laws regarding such activities" (45 CFR 46.210 of Subpart B). At the current time, Nebraska law does not restrict the use of cadaveric fetal cells and tissue for research or transplantation, although legislation was introduced in the 2000 and 2001 legislative sessions to prohibit the use of such tissue derived from elective abortions. The state's Uniform Anatomical Gift Act (Neb. Rev. Stat. Section 71-4801 et seq.) governs the donation of all cadaveric fetal tissue, with parental consent determinative. The Uniform Anatomical Gift Act also permits donors to designate the recipient of the tissue or organ donated. Federal law for federally funded research projects involving transplantation prohibits such designation.

Federal regulations set forth requirements for the process of retrieving and using tissue from a cadaveric fetus for federally funded research. Although analysts differ on the circumstances under which these requirements apply, they agree that:

1. No payment may be made to the woman or to her physician to induce the termination of a pregnancy; and
2. Researchers must be excluded from any involvement in the decision to terminate a pregnancy or in an assessment of fetal viability.

In addition, there are four prohibited federal acts that carry criminal penalties:

1. Purchase or sale of fetal tissue for “valuable consideration” beyond reasonable reimbursement for transportation, implantation, processing, preservation, quality control or storage;
2. Soliciting or acquiring fetal tissue by promising the donor that she can designate a recipient;
3. Soliciting or acquiring fetal tissue by promising the donor that a relative will be the designated recipient; and
4. Soliciting or acquiring fetal tissue by providing “valuable consideration” for the costs associated with the abortion.

Ethical Issues Concerning the Derivation and Use of Human ES and EG Cells

Moral Status of the Embryo

A critical ethical issue is the moral status of a human embryo. When is human personhood established and what implications does the answer to that question have for embryonic stem cell research? The Committee considered several different approaches to this issue including:

- Committee member Sr. Renee Mirkes, OSF, Ph.D., presents this view: “The human embryo that comes into existence at the completion of the process of fertilization is an individuated organism of human genomic material who should, throughout and beyond gestation, be treated as a person. It follows that the human embryo enjoys the right to life that cannot be sacrificed by others for the benefit of society. Hence, the embryo should be granted the full, independent rights of any other human person in human subject research.”
- The National Bioethics Advisory Commission observed another view: An embryo and early stage fetus, while worthy of respect, does not have personal moral status until at least an advanced stage of development, such as viability, or live birth. In this approach, the embryo need not be granted any independent rights, and informed consent can be permissibly obtained from the donor. An attitude expressed by the some members of the panel can be summed up in a statement written by one member:

“The right to life is an extraordinarily complex issue that can appear simple, but only when considered superficially. While attractive and reassuring in the abstract, the idea has no real concrete meaning. While it is compelling to think of the zygote, and the blastula, and the gastrula as a person in transition, it is almost certainly wrong. A zygote is a blastula in transition. A blastocyst is a gastrula in transition. Neither is a person. Neither is an organism. Both are primordial tissues; human tissues, but not yet persons.”

There are many intermediary positions that were presented and discussed by the Committee, particularly with regards to secondary issues. For example, can the issues of derivations of stem cells and use of stem cells be separate? One member wrote:

“The arguments to be considered by the Committee are not whether or not stem cells should be made available via elective abortion or via fertility treatments. Whether any of us like it or not, elective abortion and *in vitro* fertilization treatments are currently legal. Fetal stem cells (or “embryos”) are being made available and are being destroyed daily, quite independent of any arguments and discussions, however erudite, that occur in the deliberations of this Committee. Given the fact that fetal stem cells are, as we speak, being regularly harvested and destroyed, it seems to me to be morally reprehensible to not utilize these cells in research, since we are led to believe that this research holds so much hope to alleviate the suffering of so many people.”

The Committee reviewed and considered the testimony received by the National Bioethics Advisory Commission (NBAC) from the monotheistic faiths of Judaism, Christianity and Islam, and denominations thereof, concerning their religious perspectives on the moral status of an embryo. These views are presented in part in Appendix E of Volume One of the NBAC report, *Ethical Issues in Human Stem Cell Research*, which was presented and considered. In addition, several Committee members provided many religious and philosophical papers to the Committee regarding the ethical issues surrounding the derivation and use of fetal tissue and embryonic stem cells. Also, the Committee sought the additional testimony from individuals on Buddhist and Native American traditions concerning this issue. Persons of good faith hold very disparate views on this subject. These views are often based on strong religious convictions or deeply held philosophical positions. Ultimately the Committee concluded that it is not possible to achieve a complete consensus on the central issue of the moral status of the human embryo and no effort was undertaken to do so.

If one’s approach to these issues does not view research using embryonic stem cells as ethically prohibited *per se*, other significant ethical issues remain.

NIH will not fund research using human ES cells derived from embryos created solely for research. However, NBAC notes two potential benefits to using human ES cells derived from embryos created solely for research:

1. Specially created research embryos would alleviate any inadequacy of supply of human embryos remaining from IVF fertility treatments for use in research; and
2. “Well-defined embryos,” created for research, may be beneficial or vital for certain research and/or medical purposes.

Further, NBAC notes two unique ethical dilemmas concerning such use:

1. It is not clear whether there is or will be an insufficient number of embryos available after IVF infertility treatments to necessitate additional embryos as sources of these cells, or whether well-defined embryos will actually be necessary; and

2. The NBAC and NIH believe that, unlike the situation with excess IVF embryos, there is not “sufficient societal agreement on the moral practice” of creating embryos at this time to permit federal funding for it.

The controversy is based upon what NBAC characterizes as the ‘discarded-created’ distinction. At the heart of this distinction is a concern about what NBAC calls instrumentalization – treating the embryo as a mere object. There is a fear that such a practice may lead society to think of embryos as nothing more than a means to an end. Whereas, the practice of creating embryos for implantation maintains a respectful regard for the embryo that is absent in embryos created solely for research purposes.

NBAC recommended that NIH not fund research using SCNT-produced embryos because of the unclear utility of using SCNT-produced embryos for human ES cells and the uncertainty of whether a SCNT-produced blastocyst has the potential to become a human being. NIH agreed.

An assessment of the current scientific knowledge indicates that at the present time there is not a viable alternative source to using stem cells derived from human embryos or human EG cells from cadaveric fetal tissue. There are efforts underway for the development of alternative sources, e.g., use of human AS cells, to eliminate the need for the use of cells derived from embryonic or fetal sources. However, at this time, human AS and human ES or EG cells are not scientifically interchangeable. NIH reports in the November 21, 2000 Summary of Public Comments on Draft Guidelines that:

“Given the enormous potential of stem cells to the development of new therapies for the most devastating diseases, it is important to simultaneously pursue all lines of promising research. It is possible that no single source of stem cells is best or even suitable/usable for all therapies. Different types or sources of stem cells may be optimal for treatment of specific conditions. In order to determine the very best source of many of the specialized cells and tissues of the body for new treatments and even cures, it is vitally important to study the potential of adult stem cells for comparison to that of hPSCs derived from embryos and fetuses. Unless all stem cell types are studied, the differences between adult stem cells and embryo and fetal-derived hPSCs will not be known.

Moreover, there is evidence that adult stem cells may have more limited potential than hPSCs (human pluripotent stem cells). First, stem cells for all cell and tissue types have not yet been found in the adult human. Significantly, cardiac stem cells or pancreatic islet stem cells have not been identified in adult humans. Second, stem cells in adults are often present in only minute quantities, are difficult to isolate and purify, and their numbers may decrease with age. For example, brain cells from adults that may be neural stem cells have been obtained only by removing a portion of the brain of an adult with epilepsy, a complex and invasive procedure that carries the added risk of further neurological damage. Any attempt to use stem cells from a patient’s own body for treatment would require that stem cells would first have to be isolated from the patient and then grown in culture in sufficient numbers to obtain adequate quantities for treatment. This would mean that for some rapidly progressing disorders, there may not be

sufficient time to grow enough cells to use for treatment. Third, in disorders that are caused by a genetic defect, the genetic error would be present in the patient's stem cells, making cells from such a patient inappropriate for transplantation. In addition, adult stem cells may contain more DNA abnormalities caused by exposure to daily living, including sunlight, toxins, and errors made during DNA replication than will be found in fetal or embryonic hPSCs. Fourth, there is evidence that stem cells from adults may not have the same capacity to multiply as do younger cells. These potential weaknesses may limit the usefulness of adult stem cells.”

Another moral consideration opponents of human ES and EG cell research raise is the argument that tax funding for such research violates the beliefs of citizens when they are required to subsidize an objectionable activity. Sometimes, however, legislators choose to fund programs that many people find morally objectionable (i.e., nuclear arms and other military expenditures), because the activity has value and addresses legitimate objectives of public funding (i.e., national defense).

Ethical Acceptability of Conducting Research Involving Either the Derivation or Use of Human ES or EG Cells

The Nebraska Bioethics Advisory Committee did not, and has concluded that it will not, reach complete consensus on the variously represented religious and ethical positions on the question of personhood of an embryo and/or fetus. There has been consideration of and respect given to the disparate views expressed by the committee members. The majority of Committee members believe that the University of Nebraska may ethically engage in research utilizing human embryonic germ (EG) cells and/or human embryonic stem (ES) cells and that such research should be conducted under defined ethical constraints. A minority of the Committee members believe that such research should not be conducted under any circumstance and that any related research should solely utilize human adult stem (AS) cells or focus on expanding the utility of human AS cells.

Members of the Nebraska Bioethics Advisory Committee who are scientific researchers report that both they and their colleagues choose scientific research material based, in part, on availability. If the scientific utility is equal between human AS cells and human ES or EG cells for a particular research protocol, the primary investigator would choose to use human AS cells because of the relative ease of obtaining them.

Many of the recommendations of the Committee are consistent with those of the National Bioethics Advisory Commission. However, the latter's recommendations apply only for research funded by the federal government. The Nebraska Committee's recommendations, if adopted, would apply to all research at the University of Nebraska regardless of funding source.

The Committee adhered to the recommendations of the National Bioethics Advisory Commission regarding which sources of human ES and EG cells the University of Nebraska should utilize, if research using such cells is undertaken. Human ES cells from embryos made solely for research purposes are rejected, as well as human ES cells from embryos produced using somatic cell nuclear transfer (cloning). The former is rejected due to the concern about

instrumentalization. Cells from cloning are rejected at this time due to the many unknowns surrounding the utility of such cells.

The Nebraska Bioethics Advisory Committee believes that human EG or ES cells should be utilized in research at the University of Nebraska when, and only when, human AS cells would not be scientifically suitable material for the research. In addition, the use of human ES or EG cells needs to be scientifically justified both as to its potential contribution to knowledge and as to the appropriateness of using stem cells from embryonic sources. To this end, the Committee recommends that each research proposal involving human ES or EG cells be reviewed by experts in the field to make such determinations prior to IRB approval. The review process should be flexible and designed to mesh with the IRB review process in order to prevent undue bureaucratic burdens.

In a previous recommendation submitted to President L. Dennis Smith, the Committee recommended expanding the current scope of IRB reviews at the University of Nebraska, as well as adding reporting requirements to inform the public of ethical issues. Below is the background and text of these recommendations:

“The new NIH guidelines regarding human pluripotent stem cell research expand the scope of earlier other federal regulations. IRBs are now required to also review research utilizing pluripotent stem cells derived from both human embryos and fetal tissue. The committee endorses the view that such research should be subject to IRB review.

The Committee believes that University of Nebraska should formally expand the scope of research reviewed by its IRBs in order to ensure full ethical consideration of issues related to research utilizing human fetal tissue. However, the Committee limits this scope expansion to include only research involving fetal tissue that is newly procured for the research and excludes any activity using immortalized cell line cells or tissues whether for research, diagnostic or therapeutic purposes.

A separate, but related, issue concerning the scope of work undertaken by an IRB regards public reporting. Because of the often-proprietary nature of the research reviewed, IRBs work in strict confidence and outside public scrutiny. The IRBs inform research participants that they may contact the IRB at any time during a specific research project with questions, concerns, or to report an incident that seems amiss to the participant. The IRB must investigate and resolve all complaints. However, such information is not made public. In order to improve public support and confidence in the effectiveness of the IRB process, the Committee believes that the IRBs should make periodic reports to the Board of Regents, through the President, highlighting areas of concern and ethical issues. As a report to the Board, these reports would be public documents allowing review by interested parties and the media.

- 1. Recommendation: The University of Nebraska should require IRB review and approval of all types of research involving human pluripotent stem cells and human fetal tissue, except for immortalized cell lines.***
- 2. Recommendation: Each NU IRB should prepare a report to the Board of Regents, through the President, once a year summarizing bioethical issues of potential public significance considered during the previous year by the IRB, and the number and nature of complaints received by the IRB and how resolved. This report would be a public document.”***

Consistent with their previous recommendation, the Committee again recommends IRB approval for all research conducted at the University of Nebraska using certain acceptable types

of human EG and human ES. In addition, the Committee believes that it is necessary for a separate scientific review committee to determine that the use of human ES cells or human EG cells, rather than human AS cells, is scientifically justified before the IRB approves any such research protocols.

Means of Ensuring Appropriate Consent of the Donor(s) of Embryos

The Nebraska Bioethics Advisory Committee believes that it is imperative that safeguards be in place at the University of Nebraska to ensure that donors of embryos for derivation of human ES cells be fully and properly informed of all alternatives prior to donation. Requirements of informed consent for donors of cadaveric fetal tissue are already in place at the University of Nebraska.

Need for Restrictions on the Sale or Donation of Human Embryos or Cadaveric Fetal Tissue

The Nebraska Bioethics Advisory Committee believes that there should be no inducements provided by anyone associated with the University of Nebraska to obtain either human embryos or cadaveric fetal tissue. Following the NIH *Guidelines*, only reimbursement for reasonable costs associated with certain activities related to the obtaining of such cells is permissible.

Need for Ethical Oversight and Review of Research Involving Either the Derivation or Use of Human ES or EG Cells

The Human Pluripotent Stem Cell Review Group (HPSCRG) has been created by the National Institutes of Health to ensure that research involving the derivation and/or use of human ES or EG cells is conducted in conformance with the ethical principles contained in the NIH's *Guidelines for Research Using Human Pluripotent Stem Cells*. These *Guidelines* only apply to NIH funded research. The Nebraska Bioethics Advisory Committee believes that any research conducted using human ES or EG cells at the University of Nebraska should adhere to these standards.

RECOMMENDATIONS

The following constitute the recommendations of the Nebraska Bioethics Committee.

Recommendation 1: Use of Human AS cells, EG cells and ES cells in Research

Research involving the derivation and use of human adult stem (AS) cells may be pursued at the University of Nebraska. Research involving the derivation and use of human embryonic germ (EG) cells from cadaveric fetal tissue and human embryonic stem (ES) cells from embryos remaining after infertility treatments may be conducted at the University of Nebraska if such derivation and/or use is

scientifically justified for the nature of the research to be conducted. A scientific review committee will assess the justification for the use of human ES and EG cells and report its assessment to the appropriate IRB. (See Recommendation 4.)

Recommendation 2: Human ES Cells from Embryos Produced Solely for Research Purposes Using IVF

The University of Nebraska should not conduct research involving the derivation of human ES cells from embryos produced solely for research purposes using in vitro fertilization (IVF).

Recommendation 3: Human ES Cells from Embryos Produced Using Somatic Cell Nuclear Transfer

The University of Nebraska should not conduct research involving the derivation or use of human ES cells from embryos produced using somatic cell nuclear transfer.

Recommendation 4: Create Scientific Review Committees

Scientific review committees should be created to review all research involving the derivation and use of human EG and ES cells to be conducted at a campus of the University of Nebraska. The composition of the committee should consist of at least three persons appointed by the Chairperson of the University of Nebraska campus IRB where the research is proposed. These committees may be made as ad hoc appointments for the specific purpose of reviewing the specific protocols of such research. The appointed persons shall be qualified by training and experience to review the scientific literature and to assess the scientific need for the use of human ES and EG cells. The committee should review the adequacy of the justification for using human ES and EG cells in the research proposal and report its findings to the applicable IRB prior to the IRB's approval of any such research proposal.

Recommendation 5: Requirements for Donation of Excess IVF Embryos to Stem Cell Research

Prospective donors of embryos remaining after infertility treatments should receive timely, relevant, and appropriate information adequate to make informed and voluntary choices regarding disposition of the embryos, including whether to store, donate to another woman, or discard the embryo. This should occur prior to and separate from any presentation of potential research use of the embryo.

If a prospective donor chooses to discard embryos remaining after infertility treatment, the option of donating the embryos to research may then be presented.

Notwithstanding the above, at any point in the discussion process, if the prospective donor inquires about possible research use of excess IVF embryos the person presenting the options should respond fully, with all information that is relevant to the questions presented.

In discussing the potential research use of embryos that would otherwise be discarded, the person presenting the option of donation (not a member of the research team that would use such embryos) should:

- a) Make clear that the human ES cell research is not intended to provide medical benefit to the embryo or embryo donors and that the research will destroy the embryos,**
- b) Make clear that embryos used in research will not be transferred to any woman's uterus,**
- c) Make clear that consenting or refusing to donate embryos to research will not affect the quality of any care provided to prospective donors,**
- d) Describe the general area of the research to be carried out with the embryos and the specific research protocol, if known,**
- e) Disclose the source of funding and expected commercial benefits of the research with the embryos, if known.**

Recommendation 6: No Inducements to Obtain Human Embryos or Cadaveric Fetal Tissue

To ensure that the donation of human embryos remaining after infertility treatments in excess of the clinical need is voluntary, researchers at the University of Nebraska may neither promise nor provide any inducements, monetary or otherwise, to prospective donors in order to obtain human embryos or cadaveric fetal tissue for research purposes. Further, researchers who obtain human ES or EG cells from other sources instead of directly from donors should obtain assurance that the human ES or EG cells used in the research were or will be obtained through a donation. Reimbursement for the reasonable costs incurred, by a person other than the donor, associated with the transportation, preservation, quality control and storage of the human ES or EG cells is not an inducement and is permitted.

Recommendation 7: Adherence to the NIH Oversight and Review Panel Guidelines

Notwithstanding the source of research funding, the University of Nebraska should follow all federal regulations and guidelines applicable to the derivation and/or use of human EG or ES cells.