CHAPTER 1: INTRODUCTION

[to be written]

The recent reports of technical success in isolating human embryonic stem cells and the report of an experiment that reportedly fused an enucleated cow egg with a human cell have renewed debate about the ethics of research involving human embryonic material, and have raised new concerns for some about the use of newly developed but incompletely understood cloning techniques in the context of reproduction or therapeutic research.

The President's November 14, 1998 letter requested that NBAC " undertake a thorough review of the issues associated with such stem cell research, balancing all ethical and medical considerations."

In order to respond effectively and responsibly to the President's request to consider issues related to human stem cell research, NBAC determined that it must also consider certain aspects of the broader issues of research using embryonic and fetal material, which are the sources of the embryonic stem cells described in recent research reports. Moreover, the issue of animal-human hybrid embryos adds a new dimension to the debate because it confounds the scientific and ethical determination of what constitutes a human embryo.

Clearly, much of the scientific excitement about embryonic stem cells arises from the fact that such cells appear to have the potential to develop into most (but not all) of the various cells in the body, i.e., they are more specialized than the totipotent cells in the human blastocyst, each of which can develop into a total individual. These unique characteristics are central to NBAC's considerations.

Deriving stem cells from human embryos raises, once again, all of the basic questions that pertain to embryo research:

- Is it morally acceptable for federal funding?
- Is it morally sound public policy to encourage and fund embryo research?

- Does the loss of embryos in research promote disrespect for human life?
- Can potential abuses be controlled and regulated?
- Is there is a valid and binding moral distinction that would permit research with excess embryos and forbid creating embryos for research? [1]

For these reasons, and to do its work well, NBAC expanded the scope of its analysis beyond the limited question of human embryonic stem cell research. There are additional reasons for doing so.

First, NBAC has an opportunity to provide a broad public policy framework for research that can prospectively anticipate scientific developments. Given that NBAC is charged with developing guidelines and regulations as they relate to bioethical issues arising from research on human biology and behavior (including the clinical applications of that research), and further is charged with identifying broad principles to govern the ethical conduct of research, citing specific projects only as illustrations for such principles[2], it would seem shortsighted to limit its attention to a specific type of research, when principles can be developed for a broad range of similar practices. This was the approach NBAC adopted in its recently published report on *Research Involving Persons with Mental Disorders that May Affect Decisionmaking Capacity*, and in its on-going report on *The Use of Human Biological Materials (HBMs) in Research: Ethical Issues and Policy Guidance*. In particular, the report on *HBMs* identifies a number of ethical, legal, and scientific issues relevant to the storage and research use of embryonic and fetal material, but intentionally does not extend the analysis to the research use of gametes, embryos, or fetuses.

Second, it appears that a number of new technologies may have demonstrated new ways to create human embryos. Somatic cell nuclear transfer, cell fusion, and human/non-human hybrids have expanded the diversity of reproductive technologies beyond *in vitro* fertilization (i.e., *ex utero* fertilization of egg by sperm). It will be important to consider whether the technique used to make an embryo (which subsequently could be the source of embryonic stem

[1] John Fletcher, "Current Debate on Embryo Research," 1998, circulated to the Commission.
[2] Executive Order 12975. Sec 4.

cells) offers any distinctions of scientific, ethical, or legal importance. For example, the NIH Panel concluded that two sources of human embryos for research would be acceptable for federal funding. One source was embryos in excess of clinical needs to treat infertility by *in vitro* fertilization. The second source was more controversial: to create embryos for research to answer questions of "outstanding scientific and therapeutic value" that could not be pursued using excess embryos. There are now several techniques by which such embryos might be made.

Third, it is likely that science will uncover additional characteristics of the early *ex utero* human embryo that offer additional therapeutic possibilities, separate and unique from embryonic stem cells. If these developments emerge, all of the same considerations that pertain to embryo research in general would again arise. In fact, the 1994 NIH Human Embryo Research Panel[3] cited 13 areas in which embryo research could advance scientific knowledge or could lead to clinical benefits. One among these was "the isolation of pluripotential embryonic stem cell lines for eventual differentiation and clinical use in transplantation and tissue repair."

Fourth, the work of previous U.S. bodies to address the complexities of human embryo research are not complete with respect to recent advances. At the same time, new policy statements from other countries, such as those from France and the United Kingdom, need to be carefully considered. NBAC can make a contribution by considering broadly these issues as it focuses on the President's request.

Fifth, there is considerable public interest in a broad range of technological developments in this area, not limited to human embryonic stem cell research. While the moral status of embryonic stem cells is of profound concern, this category of concern also applies more broadly to the use of embryonic and fetal material. Moreover, other ethical concerns (e.g., the relevance of donation, altruism, or commerce in determining the ethical acceptability of research) apply broadly enough to embryonic and fetal material.

[3] The 1994 NIH Human Embryo Research Panel was asked to consider various areas of research involving the *ex utero* preimplantation human embryo and to provide areas that (1) are acceptable for Federal funding, (2) warrant additional review, and (3) are unacceptable for Federal support. The panel did not consider research involving *in utero* human embryos, or fetuses, since guidelines for such research already exist in the form of regulations.

In the 1997 report, *Cloning Human Beings*, NBAC addressed a very specific aspect of cloning, namely where genetic material would be transferred from the nucleus of a somatic cell of an existing human being to an enucleated human egg with the intention of creating a child. NBAC did not revisit the issues surrounding embryo research, although it began its discussions fully recognizing that any effort in humans to transfer a somatic cell nucleus into an enucleated egg involves the creation of an embryo, with the apparent potential to be implanted *in utero* and developed to term. NBAC recognized that ethical concerns surrounding issues of embryo research had recently received extensive analysis and noted that under current law, the use of somatic cell nuclear transfer to create an embryo solely for research purposes was restricted in cases involving federal funds.

Recent developments concerning human embryonic stem cell research require that NBAC turn back to the issue of making embryos for research purposes, if not for reproductive purposes.

Finally, because some of the published work regarding embryonic stem cells derived the material from fetal tissue, it is important that NBAC also consider whether these experiments raise new ethical or legal issues regarding the use of fetal material for research (which is already regulated and acceptable for federal funding under certain conditions).

Evolution of the science and public policy

Ethical framework

Scope of the report