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The Utility of Embryonic Stem Cells

by

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"Once there is a union of sperm and egg, what you have is a living entity with a full and unique genetic character. There shouldn't be a moral coarsening of appreciation for life that allows us to think of it as nothing."¹

Robert Royal

"From the time that the ovum is fertilized, a new life is begun which is neither that of the father or the mother; it is rather the life of a new human being with his own growth. It would never be made human if it were not human already. To this perpetual evidence....modern genetic science brings valuable confirmation. It has demonstrated that from the first instant, the program is fixed as to what this living being will be: a man, this individual man with his characteristic aspects already well determined. Right from fertilization is begun the adventure of a human life, and each of its great capacities requires time to find its place and to be in a position to act."²

*Congregation for the Doctrine of the Faith
Declaration on Procured Abortion, 12-13*

While still in office, President Clinton gave instructions to Dr. Harold Shapiro, Chair of the National Bioethics Advisory Committee (NBAC) to undertake a thorough review of the issues associated with human stem cell research. The dangerous conclusion of the NBAC was that "this research is allied with a noble cause, and any taint that might attach from the source of stem cells diminishes in proportion to the potential good which the research

may yield."³ This is classic situation ethics where the ends justify the means.

Researchers at the University of Wisconsin and Johns Hopkins University have successfully isolated and cultured human primordial stem cells. These stem cells have been shown to be building blocks for almost all human tissue. These pluripotent cells apparently have the capacity to differentiate into any of the human cell types. If their differentiation can be controlled, they could be used to grow healthy tissue that would augment or replace diseased tissues. Scientists believe this potential raises the possibility of growing spare body parts or correcting such disorders as diabetes, heart disease, cancer, and Parkinson's disease.

At the same time, we must consider how these stem cells are obtained. The isolation of stem cells involves the extraction and manipulation of cells harvested from the inner mass of *blastocysts*, a fluid-filled sphere made up of cells that will become the placenta, and 15-20 cells clinging together and to the inside of the blastocyst wall that will become the embryo. These inner cells will give rise to embryonic stem cells each identical to the others, and each able to become any kind of cell in the human body. These cell lines are derived from discarded or frozen embryos. Stem cells may be harvested from the gonadal tissue of aborted fetuses, rekindling the debate about the moral status of these entities and what we may ethically do with and to them. These studies raise questions about the interplay between private funding and public oversight of morally contested research.

The Wisconsin group, led by James A. Thompson, published its work in the November 6, 1998 issue of *Science*. The "research and clinical potential for human embryonic stem cells is enormous," he writes. They will be used for studies of normal and abnormal human embryo development (birth defects), to test new drugs and especially "as a renewable source of cells for tissue transplantation, cell replacement and gene therapies."⁴ Thompson used blastocysts left over from in vitro fertilizations that would have been discarded. The donors of the blastocysts gave permission for them to be used in research.

The Geron Corp. Ethics Advisory Board recently declared that human embryonic stem cell lines not originating with fetal tissue are obviously below the threshold for independent moral standing. The problem in applying EAB's "threshold" criterion of value is that no obvious threshold exists. The human being must be respected as a person from the very first instant of its existence. Respect for the dignity of the human being excludes all experimental manipulation or exploitation of the human embryo. The practice of keeping alive human embryos in vivo or in vitro for experimental or commercial purposes is totally opposed to human

dignity. It is immoral to produce human embryos destined to be exploited as disposable "biological material."

The freezing of embryos, even when carried out in order to preserve the life of an embryo – cryopreservation – constitutes an offense against the respect due to human beings by exposing them to grave risks of death or harm to their physical integrity and denying them, at least temporarily, maternal shelter and gestation, thus placing them in a situation in which further offenses and manipulation are possible.⁵

The excitement over the potential medical utility of embryonic stem cells obscures the important issues about the scientific use and commercial exploitation of human tissue. Geron Corp. financed research that derived stem cells from aborted fetuses and from donated human embryos left over from in vitro fertilization. The hypocrisy cries out when the Geron EAB concludes that it is wrong for couples to sell their embryos. The same arguments are used to argue that donors should not share in the profits resulting from research on their embryos.

If it is wrong to commercialize embryos because of their nature, then it is wrong for everyone. It is simply inconsistent to argue that couples should act altruistically because commercializing embryos is wrong, while permitting corporations and scientists to profit financially from cells derived by destroying those embryos.

The Geron EAB addresses the issue of global justice and the emerging world order, and the dangers of marketplace values, which often dominate the way power is deployed and human problems addressed. It fails miserably, though, in considering such issues as human dignity and inviolability, the value of the human embryo, and non-commodification of human life. It sets no concrete limit on the commercial exploitation of embryo and genetic research.⁶ In Europe, restrictions on cloning, embryo research and reproductive technologies apply to all relevant activities, whether privately or publicly funded.

There are morally acceptable alternatives to the use of embryonic stem cells. New research involving adult stem cells and other advances in repair and regeneration of human tissue offer the promise that embryonic stem cells may simply be irrelevant to future medical progress. In the last two years there have been startling advances in isolating and culturing adult stem cells and even in the possibilities for dedifferentiating and redifferentiating them to produce a broader array of different cells and tissues.⁷ Advances in the use of growth factors to grow new blood vessels and nerve tissue and in the use of enzymes such as telomerase to

"immortalize" useful cell cultures also offer enormous promise, both in their own right and in combination with new knowledge about adult stem cells.⁸

The issue of cell "immortality" is at the heart of this matter. The ends of chromosomes are sections of DNA called telomeres. They get a little shorter each time a cell divides until finally they hit a critical length that signals the cell to stop dividing. In January, 1998, Geron biologists reported that an enzyme called telomerase can keep the telomeres from shrinking, allowing cells to live and divide indefinitely (A characteristic which is also possessed by cancer cells.). Telomerase is active in embryonic stem cells, which as noted above can live and divide forever. When those cells start to differentiate into specific cells for specific organs, the telomerase disappears. The company is trying to find ways to make it reappear so it will work against the deterioration associated with aging. It is also looking for ways to block telomerase in treating cancer. An enzyme, tankyrase was isolated at Rockefeller University and scientists believe that it may control telomerase functioning.

The moral problem of encouraging the destruction of human embryos for their stem cells is independent of any possible benefit expected from such research. Established by the Nuremberg Code, ethical norms on human experimentation have a demand that we never inflict death or disabling injury on any unconsenting individual of the human species simply for the sake of benefit to others. Stem cell research requiring the destruction and sacrifice of human embryos should not be supported by the government or supported by tax dollars. The existence of morally acceptable alternatives that do not involve the destruction of human life for research purposes would support the conclusion that support for embryo research is unethical, for it needlessly relies on the destruction of life to advance medical goals which can be achieved in nondestructive ways.

Contentious as the issue is, there are signs that public opinion may move toward support of at least limited embryo research. "Patients and their families faced with disabling diseases want science to move as quickly as possible," said Daniel Perry, executive of the Alliance for Aging Research.⁹ He heads a coalition of patient groups advocating research on embryonic stem cells. It must become clear to these organizations that while we have a moral obligation to the future health and welfare of people, we cannot and should not violate our moral obligation to the unborn. Human life is most vulnerable when it enters the world and when it leaves the realm of time to embark on eternity. Let us protect life throughout its miraculous development.

"Before I formed you in the womb I knew you, and before you were born I consecrated you," (Jer. 1:5).

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