

# Stem Cell Research: Magical Promise v. Moral Peril

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It was not often that the word “magic” appeared in scientific literature until the advent of the stem cell. Now, this terminology seems to appear more and more often. If even half of the promises offered in the lay and professional literature come to pass regarding the magical nature of the stem cell, perhaps this hyperbole will be forgiven.

The potential for using stem cells to cure or ameliorate a host of genetic, metabolic, and degenerative conditions has been recognized only in the past few years, and this recognition has led to a major redirection of research efforts. In this relatively short time, a mixture of facts and fantasy has propelled the issue into the headlines; the surrounding fervor is fueled not only by the promises of magic, but also by the recognition that research and therapy with stem cells is not merely a scientific issue—it is also a profoundly moral issue.

While recognizing that stem cell research is also the subject of much scientific and political debate, this Case Study will focus primarily on the moral aspects. The nub of the moral issue is the source of the stem cells that are needed for research and therapy.

## I. EMBRYONIC V. ADULT STEM CELLS

Human stem cells for research or therapy can be of embryonic, adult, or fetal origin. Embryonic stem (ES) cells can be derived from (1) embryos created specifically for the purpose of research; (2) “leftover” frozen embryos created for the purposes of in vitro fertilization; or (3) cell lines perpetuated in the lab, which were derived from either (1) or (2). Adult stem (AS) cells can be found in umbilical cord blood and placental tissue, as well as in many adult tissues, including bone marrow, fat, and brain. Fetal stem cells can be derived from primordial germ cells or the gonadal

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tissue of an aborted fetus.<sup>1</sup>

In the stem cell debate, some individuals see no moral issue regarding the origin of the cells and are ready to proceed with whatever research shows promise. Most, however, recognize the moral issue and want to show due respect for the human embryo, but, on balance, are willing to compromise the moral issue in order to accomplish the promised magic. Others urge serious reflection on the moral issue and conclude that if there are two ways to approach the magic, one ethically troubling and another avoiding the moral issue, then we should take the moral high ground, using AS cells first and ES cells only if the former do not produce the desired results. Still others believe that ES cells should not be used even in the absence of morally acceptable alternatives.

Many researchers resist the urge to use AS cells, based upon the assertion that AS cells will not work as well as ES cells. Indeed, researchers initially believed that AS cells are more difficult to isolate and use. However, recent advances challenge this belief. After reporting on the successful isolation of AS cells from fat removed in liposuction, researcher Mark Hedrick stated, "This could take the air right out of the debate about embryonic stem cells. It makes it hard to argue that we should use embryonic stem cells."<sup>2</sup> Further, and of even greater significance, it was initially assumed that ES cells were pluripotent (i.e., could transform into any cell type) while AS cells were merely multipotent (i.e., could transform into a limited number of cell types). However, reports of human AS cells transformed into liver, nerve, bone, cartilage, fat, blood, heart, and other types of cells has prompted a rethinking of this assumption as well. In announcing the laboratory transformation of AS cells from bone marrow into brain cells, researcher Ira Black revealed to his doubting colleagues the feasibility of something they, just a few months earlier, had declared impossible. He concluded his announcement with the statement that "biological dogma has to be rethought."<sup>3</sup>

Not only have the previous assumptions been proven incorrect, but also, there are other reasons that AS cells may at least theoretically have advantages over ES cells. Using stem cells from the patient into whom the transformed cells will be subsequently implanted avoids the difficult issue of histo-incompatibility. Additionally, there is a greater propensity for ES cells to undergo uncontrolled transformation and growth, generating concern about malignant degeneration.

Fundamental to the issues at hand are conceptual questions about the nature of the cells we are dealing with. It is to these questions that we now turn.

## II. THE BEGINNING AND THE END OF LIFE

Sperm and ova are human gametes. If left undisturbed, they will remain human gametes. However, once the twenty-three chromosomes from the sperm and the twenty-three from the ovum unite, they form a unique human being with the potential to pass through all of the stages of human growth and development—zygote, blastocyst, embryo, fetus, neonate, infant, child, adolescent, and adult.

Some argue that the zygote or blastocyst does not constitute a human being because each lacks the differentiated cells and tissues characteristic of human beings. Further, some argue that the blastocyst (or even the embryo or the fetus) is only a “potential human being.” Potentiality has two possible meanings. First, it may mean that the item might evolve into the item mentioned, or it might possibly turn into something else. Second, potentiality may just mean that the projected evolution might or might not happen. The human blastocyst fails both of these tests of potentiality. Once it has been formed, the blastocyst cannot develop into a dog or a sheep; it is inherently and unchangeably human and, barring unforeseen intervention, will inevitably continue to develop into a human individual.

The cells resulting from the first two or three divisions of the zygote retain totipotency (i.e., if they are naturally or artificially separated, each can develop into identical copies of the others). Some argue that these cells are then not true human individuals. We would respond that they are indeed human individuals with the potential of becoming twins.

AS cells are human cells in the same way that blood cells, brain cells, or muscle cells are human. They are living cells with forty-six chromosomes. Thus, they are human cells. They reside within human tissue that in turn is part of a human individual. AS cells can be removed from a human individual without causing any harm to that individual. But the AS cell is not a human individual as is a zygote or blastocyst.

ES cells are also human cells in that they reside within human tissue. Prior to passing the point of potential twinning, each one is a potential human individual. After that point, they are human cells that make up the blastocyst—one stage of humanhood. In theory, removing one stem cell from a blastocyst would be morally comparable to removing stem cells from an adult’s bone marrow. However, the reality is that the removal of that stem cell from the blastocyst necessarily destroys the blastocyst and thus the human individual. Herein lies the moral problem.

This essential nature of humanhood is inherent to the individual. It is not something that is imputed based on the location of the individual. Some maintain that implantation in the uterus is a more logical time to

identify the individual than is fertilization. While it is clear that pregnancy begins with implantation, the human life has already been in existence for several days prior to the beginning of pregnancy. It is interesting and ironic that in the abortion debate, many argue that it is not a human until it is "out of the uterus," while in the stem cell debate many argue that it is not a human until it is "in the uterus." These arguments based on the individual's location are feeble attempts to deny the basic fact understood and accepted by scientists for many generations: Humanhood begins with the union of twenty-three chromosomes from the ovum with twenty-three chromosomes from the sperm.

Humanhood continues from fertilization until the death of the human individual. Certainly human cells and even human tissue can die while the human individual survives. Conversely, human cells and human tissue can sometimes survive for a while after the death of the individual. But there is a time when the human individual ceases to exist. Identification of this "time of death" continues to be the subject of scientific and philosophical debate. There can be little debate, however, that removal of cells from a blastocyst leads to the immediate death of the blastocyst, constituting the intentional destruction of that developing human individual.

### III. THE ETHICS OF HUMAN SUBJECTS RESEARCH AND STEM CELLS

Having established that the human blastocyst or embryo is a human individual and thus should be accorded the same protections as other human beings, we now turn to the implications this has on the conduct of research. Human subjects research has been the focus of several international codes as well as extensive legislation in the United States. All of this legislation rests upon a common theme: Human beings are not commodities, and human beings must never be used as means to an end, but must always remain the end in themselves. Proposals to destroy embryos for research purposes clearly violate this most basic of ethical principles.

The first major international code of conduct in human subjects research is the Nuremberg Code, created in response to abuses of human subjects perpetrated by German doctors practicing under the Third Reich. The following quotes from the Code pertain to the topic at hand:

- (2) The experiment should be such as to yield fruitful results for the good of society, unprocurable by other methods or means of study, and not random and unnecessary in nature.
- (3) The experiment should be so designed and based on the results of animal experimentation and a knowledge of the natural history of the

disease or other problem under study that the anticipated results will justify the performance of the experiment.

(4) The experiment should be so conducted as to avoid all unnecessary physical and mental suffering and injury.

(5) No experiment should be conducted where there is an *a priori* reason to believe that death and disabling injury will occur; except, perhaps, in those experiments where the experimental physicians also serve as subjects.

(7) Proper preparations should be made and adequate facilities provided to protect the experimental subject against even remote possibilities of injury, disability, or death.<sup>4</sup>

A subsequent guide to human subjects research is the Declaration of Helsinki, published by the World Medical Association. The introduction to this set of research guidelines states, “considerations related to the well-being of the subject should take precedence over the interests of science and society.”<sup>5</sup> Amongst its Basic Principles, it states, “It is the duty of the physician in medical research to protect the life, health, privacy, and dignity of the human subject.”<sup>6</sup> It further states, “Every medical research project involving human subjects should be preceded by careful assessment of predictable risks and burdens in comparison with foreseeable benefits to the subject or to others.”<sup>7</sup>

In 1997, the European Union (EU) declared that, “The interests and welfare of the human being shall prevail over the sole interest of society and science.”<sup>8</sup> With regard to an individual who cannot consent to involvement in research, the EU stated that, “an intervention may only be carried out on a person who does not have the capacity to consent, for his or her direct benefit.”<sup>9</sup>

The 1979 Belmont Report published by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research laid the foundation for research ethics in the United States. It said that research involving human subjects should be guided by the principles of beneficence, nonmaleficence, and justice.<sup>10</sup> The current U.S. statute governing human subjects research, known as the Common Rule, defines “human subject” as “a living individual about whom an investigator [whether professional or student] conducting research obtains (1) data through intervention or interaction with the individual, or (2) identifiable private information.”<sup>11</sup> Specifically addressing research involving wards and children unable to give assent, the Common Rule states that research involving greater than minimal risk that will not yield direct benefit to the child, but will most likely produce generalizable knowledge about the child’s disease or condition, requires that an

institutional review board (IRB) find the risk to be only a minor increase over minimal risk and that the procedures be “reasonably commensurate” with those inherent in the child’s condition.<sup>12</sup> Furthermore, if the research involves risk beyond this category, it is necessary that the research offers a reasonable opportunity to understand, prevent, or ameliorate a serious problem that affects the health and welfare of children.<sup>13</sup>

In addition to these regulations, the U.S. National Bioethics Advisory Commission (NBAC) declared that “the derivation of stem cells from embryos...is justifiable only if no less morally problematic alternatives are available for advancing the research.”<sup>14</sup>

How then does ES cell research measure up to these standards of human research ethics? Animal models are still being developed and have not matured to the point of justifying the extraordinary claims for ES cell treatments. Thus, any claim that human embryos need to be destroyed now is unjustified. The data to date strongly suggest that the desired results are procurable using other means than ES cell research.<sup>15</sup> The risks and burdens to the subject are clear, and proceeding with ES cell research clearly disregards the welfare and well-being of the subject for the sake of the “good of society.” Further, these human embryos are not being exploited for the benefit of other embryos or very young children, but explicitly for adults, generally with adult-onset disorders. In summary, the proposed destruction of human embryos for research purposes is a clearly unethical violation of accepted principles, guidelines, and codes for human subjects research.

#### IV. RATIONALE FOR ES CELL RESEARCH

Research abuses perpetrated on post-natal subjects led to the development of these codes. However, it is eerily disturbing that arguments offered in the current debate about stem cell research employ the same rationales as those used by German physicians in their defense during the Nuremberg Trials. The following key points of comparison have been gleaned from a more complete enumeration by Michael Grodin.<sup>16</sup>

First, “[r]esearch is necessary in times of war and national emergency. Military and civilian survival may depend on the scientific and medical knowledge derived from human experimentation. Extreme circumstances demand extreme action.”<sup>17</sup> We are confronting a crisis of phenomenal proportions as millions are afflicted with diabetes, Parkinson’s disease, Alzheimer’s disease, and cancer. Indeed, the rhetoric of war is so prominent in the stem cell discussion that some researchers have claimed that the suffering of millions will be on the hands of those who do not permit and support this research.<sup>18</sup>

Second, “[t]he prisoners utilized for human experimentation were already condemned to death.”<sup>19</sup> Geneticist Jerome Lejeune has called these “leftover” frozen embryos prisoners in “the concentration can.”<sup>20</sup> It has been claimed that these individuals should be used for research purposes since their fate is already doomed.

Third, “[e]xperimental subjects were selected by the military leaders of the prisoners themselves. An individual physician thus could not be held responsible for the selections.”<sup>21</sup> Similarly, the NBAC argued that the “leftover” embryos have been rejected by their parents and, thus, that the research community bears no responsibility for their deaths.<sup>22</sup>

Fourth, “[s]ometimes it is necessary to tolerate a lesser evil, the killing of some, to achieve a greater good, the saving of many.”<sup>23</sup>

Finally, “[w]ithout human experimentation, there would be no way to advance the progress of science and medicine.”<sup>24</sup> While this statement is indeed true, codes, guidelines, and regulations have been developed specifically for the purpose of bridling this research enthusiasm with ethical principles. One such principle is that human subjects research is never to result deliberately in the death of the subject, regardless of how much supposed good may result from the investigation.

Moreover, the Nuremberg tribunal, guided by the overarching principle that human beings are never to be treated as a means to an end, but must always be ends in themselves, soundly rejected the above arguments. It is sad and ironic that as the generation that bequeathed to us the Nuremberg Code is passing, we are discarding the wisdom it gained at such a high price. Using identical utilitarian and pragmatic reasoning, contemporary politicians, scientists, and the public at large are endorsing the commodification and destruction of members of our human family.

We are equating neither stem cell researchers with Nazi physicians, nor this issue with the Holocaust. We recognize that proponents of ES cell research are motivated by the desire to benefit individuals and society and not by racist eugenic policy. The focus of our argument is on human subjects research abuses. The historical record is clear that the logic and reasoning used to justify those abuses is identical to that being used today to justify the destruction of embryos. This should make us all pause and seriously reconsider these actions and proposals. Instances of human subjects abuse in America have resulted from the same flawed thinking. The Tuskegee syphilis study that devalued and commodified African-American men, the Willowbrook hepatitis study that commodified individuals with mental retardation, as well as others, claimed to focus on the greater good for the larger community. Yet, each suffered from the flaw of reducing its subjects to means to a larger end.

We must also address the “stewardship” argument that is used to support the use of human embryos that are “leftovers” from in vitro fertilization. This argument maintains that the life will be lost anyway, as the embryo is destined to be thawed and discarded at the choice of the conceiving parents, and that we should allow the so-called redemption of this loss by using that life for research purposes. We must consider, though, that doing so only accepts and supports the erroneous and tragic approach of the infertility industry that perceives children as products and embryos as commodities. In reality, each embryo conceived is a child of the conceiving couple, and it is brazenly irresponsible to promote the idea that the parents have a right to discard as excess material the very child whom they deliberately conceived. A society that chooses to capitalize on this tragedy acts as opportunists, not as stewards.

If we are truly interested in the stewardship of the lives in question, we should promote responsible methods of assisting reproduction that do not result in the problem of having excess embryos. We should restrict fertilization to the number of embryos that the couple is willing to implant. Alternatively, we might insist that cryo-preservation occur at the pronuclear phase before fertilization is complete and a new, genetically unique human being has been conceived. This method has been demonstrated to be superior in terms of outcomes, yet the vast majority of fertility programs still cryo-preserve unimplanted embryos post-fertilization during the true embryonic phase. Further, when unimplanted embryos do exist, we should promote embryo donation and adoption.<sup>25</sup>

Moreover, if we as a society actually believed in “stewardship,” we would support research on prisoners condemned to death, and we would remove their transplantable organs either with or without consent. Yet, when recent Washington hearings discussed such practices taking place in other countries, the response, very appropriately, was one of horror and condemnation.<sup>26</sup> These events are not acceptable, because they cross a line that must not be crossed—they commodify human beings and reduce them to means to an end. Similarly, we cannot in good conscience demean and commodify another group of our human family, targeting them for destruction and harvesting them for a larger “social good.”

## V. REGULATION AND FUNDING OF STEM CELL RESEARCH

The moral issues raised by the use of stem cells for research or therapy has led to legal prohibition or restriction in many jurisdictions. In the United States, a lack of federal legislation governing this issue has resulted in intense political discussion of the provision of federal funds—a debate that strongly echoes the debate on federal funding for abortion services.

While this Case Study will not review this political issue, the recent attempts at compromise deserve commentary.

President Clinton issued an executive order that allowed the use of federal funds for stem cell research, with the condition that federal dollars were not to be used to fund the actual retrieval of those stem cells. That compromise allowed the contemporaneous destruction of blastocysts using non-federal funds and the immediate transfer of those stem cells to federally funded research. President Bush proposed funding regulations that (1) encourage research with stem cells not of embryonic origin (free of moral implications) and (2) limit research on ES cells to the approximately sixty existing cell lines.

The primary issue raised by these compromises is that of moral complicity. Does the use of the product—or even information—gleaned from an immoral act implicate the current user in the moral wrong? An analogy often cited in an attempt to deny the concern of moral complicity is the transplantation of organs retrieved from a person who has been murdered. This does not implicate the surgeons or the recipient in the murder. Additionally, it redeems some good from that horrible act.

Debate about moral complicity has gone on without consensus regarding the use of data from immoral research, the use of illustrations made by the Nazi anatomist Eduard Pernkopf, the military use of information gained by Japanese biological warfare from 1932 to 1945, the use of vaccines developed using aborted fetal tissue, and other such atrocities. Some believe that the use of such information dishonors those who were immorally harmed or killed. Others claim redeeming value in salvaging some goodness from the immoral acts. The American Medical Association's Council on Ethical and Judicial Affairs concluded: "If ethically tainted data that have been validated by vigorous scientific analysis are the only data of that nature available, and such data are necessary to save lives, then the utilization of such data by physicians and editors may be appropriate."<sup>27</sup>

The issue of separation of actions and intentions is determinative in discussions of moral complicity. In the Clinton compromise, the acts of retrieval of stem cells and research were separated, but the intentions were not. This disparity leads us to conclude that this compromise involved significant moral complicity of the researchers and of the author of the compromise.

The second part of the Bush compromise also raises the question of moral complicity. The acts that produced those sixty cell lines involved the immoral destruction of human blastocysts or embryos. The subsequent use of the perpetuated cell lines does not involve any inherent immorality, but

it may involve moral complicity. Given that cell lines can be used in research and therapy for years, this issue is not a trivial one.

This sequence of events initially seems morally comparable to the use of organs retrieved from a murder victim. The murder is immoral, but the transplant is not; embryo destruction is immoral, but the research is not. But they are not the same. The difference is that the intention of the murderer is murder, not transplantation. The intention of those researchers who originally retrieve the stem cells is the use of those cells in research. To pick a point in time to distinguish allowable use from disallowed use is clearly arbitrary. Thus, current researchers may not be fully absolved from moral complicity, since they are using cell lines perpetuated after an immoral act for the actual purpose intended by the immoral act.

If President Bush had said, "I'm going to wait until there seems to be enough cell lines to declare a moratorium," that would have involved moral complicity. However, on the first opportunity he had to affect the direction of this research issue, he said, "While it is unethical to end life in medical research, it is ethical to benefit from research where life and death decisions have already been made."<sup>28</sup> His political compromise followed this reasoning.

As such, his compromise is not totally morally clean, but it is morally acceptable. It will never be justifiable, however, to say, "We don't have enough basic material. We need to allow another batch of cell lines through the gate." This would negate the arbitrary separation of allowed and disallowed research.

## CONCLUSION

The retrieval of ES cells for use in research or therapy involves the immoral destruction of human individuals. Several codes of research ethics prohibit the use or destruction of human individuals for the benefit of others. The use of AS cells to pursue the magical promises of this research avoids this moral problem. The current compromise raises some issue of moral complicity, but it is morally acceptable as a one-time event.

## References

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