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## Restricting Human Embryonic Stem Cell Research: Creating Life or Destroying Freedom.

Matt Massar

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# COMMENTS

## RESTRICTING HUMAN EMBRYONIC STEM CELL RESEARCH: CREATING LIFE OR DESTROYING FREEDOM?

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*We must pursue research on embryonic stem cells. With the life expectancy of average Americans heading as high as 85 to 90 years, [it is] our responsibility to do everything possible to protect the quality of life of the present and future generations. A critical factor will be what we do with human embryonic stem cells. These cells have the potential to cure diseases and conditions ranging from Parkinson's and multiple sclerosis to diabetes and heart disease, Alzheimer's, Lou Gehrig's disease, even spinal-cord injuries like my own. They have been called the body's self-repair kit.<sup>1</sup>*

- Christopher Reeve

## I. INTRODUCTION

### A. Stem Cell Research

The invention of microscopes in the 1800s allowed scientists to observe cells more closely, bringing cellular research to the forefront of scientific inquiry.<sup>2</sup> In the twentieth century, scientists began to further understand cell division and different types of cells, and by 1963, scientists discovered the ability of stem cells to replicate and regenerate.<sup>3</sup> In November 1998, James Thomson, a scientist at the University of Wisconsin-Madison, successfully isolated and cultured human embryonic stem cells (hESCs) in a laboratory.<sup>4</sup>

Many scientific and medical experts believe hESC research may lead to cures for a wide variety of chronic and terminal diseases. These controversial claims remain hotly debated amongst religious, political, medical, and scientific communities. The true potential of hESC research is still unknown, and experts continue to gather mixed research results due in large part to the complicated procedural and legislative hurdles surrounding research, ownership, and federal funding for embryonic stem cell research. More clear and consistent research results could be attained if certain hESC regulations are lifted, but this, too, is surrounded by controversy.<sup>5</sup>

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1. Prepared Testimony of Christopher Reeve: Hearing Before the Senate Committee on Appropriations Labor, Health and Human Services Subcommittee on Embryonic Stem Cell Research, *Federal News Service* (April 26, 2000) (statement of Christopher Reeve).

2. The UK Stem Cell Foundation, Stem Cell Research: History, <http://domain883347.sites.fasthosts.com/research/history.html> (last visited July 18, 2007).

3. *Id.*

4. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 1 (2006).

5. See David A. Prentice, *Current Science of Regeneration Medicine with Stem Cells*, 54 J. INVESTIGATIVE MED. 35 (2006), available at <http://www.wheaton.edu/Biology/Prentice-current-science-regenerative-medicine-stem-cells.pdf> ("In summary, a great deal of work remains to be done before widespread clinical application of stem cells for regenera-

## B. *Ethical Debate*

The recently discovered potential benefits of hESC research give hope for myriad scientific cures and breakthroughs in the future. However, harvesting embryonic stem cells, unlike adult stem cells, involves the destruction of an embryo, and this fact resurrects age-old questions of life, law, and religion. Opponents of hESC research often focus on issues such as cloning, abortion, and/or the sanctity of human life.<sup>6</sup> They believe a human embryo is a human being.<sup>7</sup> Opponents argue that this embryonic source of human life, while possibly beneficial for research, should not be sacrificed for research purposes.<sup>8</sup> Contrary to most scientific thought on the subject, some opponents of hESC research believe hESC research is unnecessary because adult stem cells provide research benefits equivalent to embryonic stem cells.<sup>9</sup>

Proponents of hESC research, on the other hand, would like to see both adult and embryonic stem cells researched.<sup>10</sup> They claim that embryonic stem cells contain significant value and are vital for great advances in research to combat diseases such as Alzheimer's, heart disease, and cancer.<sup>11</sup> Proponents argue that a fertilized egg only represents a potential for human life, and it does not represent a human life until successfully implanted into a woman's reproductive system.<sup>12</sup> Proponents of hESC research believe that these great advances in disease research outweigh the harm of destroying embryos.<sup>13</sup>

Current governmental regulation of embryonic stem cell research serves as a major contributing factor for this division in the stem cell re-

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tive medicine. Given the scientific hurdles that yet remain to be overcome for ES cells, they may be less well suited for clinical applications than for basic scientific studies.”).

6. EILEEN L. DANIEL, *TAKING SIDES: CLASHING VIEWS IN HEALTH AND SOCIETY* 147–48 (2006) (analyzing different perspectives on whether embryonic stem cell research should be permitted).

7. The American Association for the Advancement of Science, AAAS Policy Brief: Stem Cell Research, <http://www.aaas.org/spp/cstc/briefs/stemcells/index.shtml> (last visited July 18, 2007) (articulating the ethical dispute between proponents and opponents of hESC).

8. *Id.*

9. *Id.* (“Most scientists, however, dispute this claim, citing great potential in the field of adult stem cells but several drawbacks as compared with hESCs.”).

10. *Id.*

11. EILEEN L. DANIEL, *TAKING SIDES: CLASHING VIEWS IN HEALTH AND SOCIETY* 147–48 (2006).

12. The American Association for the Advancement of Science, AAAS Policy Brief: Stem Cell Research, <http://www.aaas.org/spp/cstc/briefs/stemcells/index.shtml> (last visited July 18, 2007).

13. See EILEEN L. DANIEL, *TAKING SIDES: CLASHING VIEWS IN HEALTH AND SOCIETY* 147–48 (2006).

search debate.<sup>14</sup> In 2001, President George W. Bush issued a moratorium against further federal funding for hESC research, saying, “We do not end some lives for the medical benefit of others.”<sup>15</sup> The National Institutes of Health (NIH), a federal agency devoted to medical research, implemented guidelines for the moratorium.<sup>16</sup> While hESC research is not illegal, the current legislation restricts federally funded hESC research to only those hESC lines already in existence at the time of the 2001 moratorium, thereby prohibiting allocation of federal funds for developing new hESC strains.<sup>17</sup> The other hESC strains, or lines, may still be researched, but only with state or private funds.<sup>18</sup> The halt on federally funded hESC research significantly restricts research possibilities. Federal funding has historically been a catalyst for generating many of the breakthrough medical discoveries that made incredible changes in the lives of Americans and individuals worldwide.<sup>19</sup>

This comment will analyze how the current embryonic stem cell debate sparked a reexamination of the definition of human life and the government’s role in regulating a woman’s right to choose what she does with her body. In addition, it will examine past legal precedent regarding life, cells, and governmental interaction with these particular issues. Finally, this comment will examine recent technological innovations and emerging research, demonstrating why this research demands that the government take a more proactive stance on hESC research in order to better protect and further the lives and freedoms of not only women, but the lives and freedom of all American citizens.

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14. PollingReport.com, Science and Nature: Origin of Human Life, <http://www.pollingreport.com/science.htm> (last visited July 18, 2007) (citing Newsweek Poll: fifty percent Americans say Bush administration should change stance in light of new technology).

15. United States Department of Health & Human Services, Fact Sheet: Embryonic Stem Cell Research, <http://www.hhs.gov/news/press/2004pres/20040714b.html> (last visited July 18, 2007) (“Stem cell research is still at an early, uncertain stage, but the hope it offers is amazing: infinitely adaptable human cells to replace damaged or defective tissue and treat a wide variety of diseases. Yet the ethics of medicine are not infinitely adaptable. There is at least one bright line: We do not end some lives for the medical benefit of others.”).

16. National Institutes of Health, Stem Cell Information: Federal Policy, <http://stemcells.nih.gov/policy/> (last visited July 18, 2007) (outlining NIH’s role and federal policy regarding hESC research).

17. *Id.* (defining the limits of funding for hESC research).

18. G.P. Fischbach & R.L. Fischbach, *Stem Cells: Science, Policy, and Ethics*, 114 J. CLINICAL INVESTIGATION 1, 114, 1364–70 (2004).

19. See REBECCA DUDZIK HAM, STEM CELL RESEARCH: THE CASE FOR FEDERAL FUNDING 6–8 (2001), <http://www.ndol.org/documents/stem-cell-research.pdf> (outlining the medical possibilities regarding hESC research).

## II. LEGAL HISTORY

### A. *What is a Stem Cell?*

A stem cell is an unspecialized cell that contains the ability to become a differentiated cell.<sup>20</sup> This “generic” type of cell can self-replicate, or make copies of itself, indefinitely, in order to produce specialized cells to aid in the function and repair of various living tissues in the body.<sup>21</sup> Scientists can cultivate and maintain these cells forever and develop them into specialized cells when necessary.<sup>22</sup>

There are two types of stem cells: adult and embryonic stem cells. Adult stem cells are differentiated cells, meaning they are already developed to serve a specific cellular purpose.<sup>23</sup> Every human being possesses adult stem cells throughout the body in various tissues and organs such as the brain, skin, skeletal muscle, blood, and blood vessels.<sup>24</sup> Adult stem cells lack research versatility because of their specific, differentiated bodily purpose.<sup>25</sup> Recent experiments, however, show that certain types of adult stem cells are pluripotent (able to differentiate) to a certain degree.<sup>26</sup>

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20. Meriam-Webster’s Online Dictionary, <http://www.m-w.com/dictionary/stem%20cell> (last visited July 18, 2007) (defining stem cell as “an unspecialized cell that gives rise to differentiated cells”).

21. Healthline.com, Stem Cell Research Health Article, [http://www.healthline.com/adamcontent/stem-cell-research?utm\\_term=stem%20cell&utm\\_medium=mw&utm\\_campaign=article](http://www.healthline.com/adamcontent/stem-cell-research?utm_term=stem%20cell&utm_medium=mw&utm_campaign=article) (last visited July 18, 2007) (“A stem cell is a ‘generic’ cell that can make exact copies of itself indefinitely. In addition, a stem cell has the ability to produce specialized cells for various tissues in the body — such as heart muscle, brain tissue, and liver tissue.”).

22. *Id.* (“Scientists are able to maintain stem cells forever, developing them into specialized cells as needed.”).

23. *Id.* (stating that adult stem cells “are specific to certain cell types, such as blood, intestines, skin, and muscle”).

24. National Institutes of Health, Stem Cell Information: Stem Cell Basics, <http://stemcells.nih.gov/info/basics/basics4.asp> (last visited July 18, 2007) (“The adult tissues reported to contain stem cells include brain, bone marrow, peripheral blood, blood vessels, skeletal muscle, skin and liver.”).

25. Healthline.com, Stem Cell Research Health Article, [http://www.healthline.com/adamcontent/stem-cell-research?utm\\_term=stem%20cell&utm\\_medium=mw&utm\\_campaign=article](http://www.healthline.com/adamcontent/stem-cell-research?utm_term=stem%20cell&utm_medium=mw&utm_campaign=article) (last visited July 18, 2007) (“[T]hese [adult stem cells] are not as versatile for research purposes because they are specific to certain cell types, such as blood, intestines, skin, and muscle. The term ‘adult stem cell’ may be misleading because both children and adults have them.”).

26. National Institutes of Health, Stem Cell Information: Stem Cell Basics, <http://stemcells.nih.gov/info/basics/basics4.asp> (last visited July 18, 2007).

(“[A number of experiments have suggested that certain adult stem cell types are pluripotent. This ability to differentiate into multiple cell types is called plasticity or transdifferentiation. The following list offers examples of adult stem cell plasticity that have been

Embryonic stem cells, unlike adult stem cells, originate from embryos (extracted from either aborted fetuses or left-over fertilized eggs in fertility clinics).<sup>27</sup> Under special circumstances, embryonic stem cells retain plasticity and ability to drastically change and become a different type of cell (like a brain cell or a blood cell). The ability to change allows embryonic stem cells to produce cells to grow almost every bodily tissue.<sup>28</sup> The marked difference from normal adult stem cells, which normally do not change, makes embryonic stem cells better suited for medical research.

The ability of rapid cellular change by embryonic stem cells leads many scientists and researchers alike to believe that hESC lines may be able, via further research, to strengthen the immune system and aggressively combat disease.<sup>29</sup> Research shows that injecting these cells into damaged areas of the body may effectively treat and possibly cure those suffering from spinal cord injuries and diseases such as Parkinson's, leukemia, immune deficiencies, diabetes, and Alzheimer's.<sup>30</sup>

Production of an hESC line for research can occur in two different ways—using embryos donated through in vitro fertilization clinics or using embryos created by somatic cell nuclear transfer (SCNT).<sup>31</sup> Both

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reported during the past few years. Hematopoietic stem cells may differentiate into: three major types of brain cells (neurons, oligodendrocytes, and astrocytes); skeletal muscle cells; cardiac muscle cells; and liver cells. Bone marrow stromal cells may differentiate into: cardiac muscle cells and skeletal muscle cells. Brain stem cells may differentiate into: blood cells and skeletal muscle cells.”). *Id.*

27. Healthline.com, Stem Cell Research Health Article, [http://www.healthline.com/adamcontent/stem-cell-research?utm\\_term=stem%20cell&utm\\_medium=mw&utm\\_campaign=article](http://www.healthline.com/adamcontent/stem-cell-research?utm_term=stem%20cell&utm_medium=mw&utm_campaign=article) (last visited July 18, 2007) (“[T]hese [embryonic stem cells] are obtained from either aborted fetuses or fertilized eggs that are left over from in vitro fertilization (IVF).”).

28. *Id.* (asserting that embryonic stem cells remain useful for research and medical purposes since they can make cells for nearly every body tissue”).

29. MayoClinic.com, Cancer: Stem Cell Transplant, <http://www.mayoclinic.com/health/stem-cell-transplant/CA00067> (last visited July 18, 2007) (“Stem cell transplants are used to treat people whose stem cells have been damaged by disease or treatment of a disease. Stem cell transplants can benefit a variety of both cancerous (malignant) and non-cancerous (nonmalignant) diseases.”).

30. See JOSEPH PANNO, *STEM CELL RESEARCH: MEDICAL APPLICATIONS & ETHICAL CONTROVERSY* 34–41 (2005) (describing the various medical applications of stem cell research); see also Pamela Fayerman, *Stem Cell Find Promising for Leukemia*, VANCOUVER SUN, Aug. 16, 2007 (“B.C. Cancer Agency scientists have found there are multiple subtypes of blood stem cells, a discovery that could eventually lead to customized bone marrow transplants for leukemia patients.”).

31. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 52 (2006).

methods extract cells from three-to-five-day-old embryos, called blastocysts, which are made up of 50-150 cells.<sup>32</sup>

### B. *In Vitro Fertilization (IVF)*

Embryos historically developed only naturally inside a woman's reproductive system, but in 1978, two doctors developed a process known as in vitro fertilization (IVF), which allows embryo development "outside" the woman's reproductive system.<sup>33</sup> The IVF procedure extracts a batch of eggs from a woman, fertilizes them "outside" the reproductive system, and implants them back into the same reproductive system or into another woman's reproductive system with the hope that one of the embryos will implant and successfully develop into a healthy pregnancy for the carrying mother.<sup>34</sup> Since its inception, IVF assisted mothers in the births of more than 20,000 babies worldwide.<sup>35</sup> Once one or more of the embryos successfully implants, the remaining embryos are removed and, at the discretion of the mother, either frozen for later use, donated, or discarded.<sup>36</sup> Every year, fertility clinics discard and allow approximately 400,000 embryos to go to waste.<sup>37</sup> James Thompson used one such donated embryo from an IVF clinic to produce and cultivate the first lab-grown hESC line.<sup>38</sup>

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32. National Institutes of Health, Stem Cell Information: Stem Cell Basics, <http://stemcells.nih.gov/info/basics/basics1.asp> (last visited July 18, 2007) ("In the 3- to 5-day-old embryo, called a blastocyst, stem cells in developing tissues give rise to the multiple specialized cell types that make up the heart, lung, skin, and other tissues.").

33. S. Bassil, P.A. Godin & J. Donnez, *Outcome of In-vitro Fertilization Through Natural Cycles in Poor Responders*, 14 HUM. REPROD. 5, 1262 (1999) (discussing the historical development of IVF, stating that "[t]he first successful birth after in-vitro fertilization (IVF) was achieved in a natural, unstimulated cycle").

34. *See id.*

35. Georgia Reproductive Specialists, *In Vitro Fertilization (IVF-ET)*, <http://www.ivf.com/ivffaq.html> (last visited July 18, 2007) (adding that IVF increases the possibility of a continuing pregnancy).

36. *Id.* ("A maximum of four pre-embryos will be transferred to the uterus for possible implantation. Patients will have several other options regarding the disposition of the remaining pre-embryos. One option is to freeze pre-embryos for [their] later use. Other options are to donate or simply dispose of them. Excess pre-embryos, if any, belong to you [them], and you [they] will determine what is to be done.").

37. *Senators Urge Repeal of Stem-Cell Research Restrictions*, DAILY NEWS CENT., May 26, 2005, <http://health.dailynewscentral.com/content/view/000874/44/> ("The bill's supporters contend the government's funds would be authorized only for research on some of the approximately 400,000 fertilized embryos that are discarded annually by fertility clinics because the would-be parents no longer want them. The embryos are harvested as part of in vitro fertilization, which typically yields many more than are needed for fertility treatments.").

38. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 52 (2006) (describing the method of



### C. Somatic Cell Nuclear Transfer (SCNT) and “Cloning”

The other source for hESC lines is somatic cell nuclear transfer (SCNT). The procedure involves removing a cell (skin or muscle, for example) from an individual and fusing this cell with an empty human egg, thereby creating a blastocyst.<sup>39</sup> Cells removed from the blastocyst form an hESC line genetically identical to an individual.<sup>40</sup> SCNT is also called “therapeutic cloning” in medical research and, unlike IVF, draws confusion and criticism because its nickname implies a link between hESC research and cloning.<sup>41</sup>

Cloning represents many different meanings in many different industries.<sup>42</sup> A year before publication of James Thomson’s hESC procedure, Dolly, a genetically cloned sheep, was born in Scotland via SCNT.<sup>43</sup> Since that time, cloning animals remains a highly controversial and only moderately effective procedure due to the high mortality rate of these embryos and the health problems of the animals once born.<sup>44</sup> Skepticism abounds that discovering how to clone an animal will eventually lead to human cloning.<sup>45</sup>

The importance of understanding the scientific terminology regarding reproductive cloning and hESC research is essential—the two produce very different outcomes. An animal clone is created via reproductive

using “embryos donated from *in vitro* fertilization clinics—essentially the procedure that James Thomson and others use”).

39. *Id.* at 54 (diagramming the cultivation of an hESC line).

40. *Id.* at 54 (“Because all of the cells contain a faithful copy of the patient’s DNA, the hESC line is an exact [genetic] match.”).

41. Daniella Goldberg, Cloning Around With Stem Cells, <http://www.abc.net.au/science/slab/stemcells/default.htm> (last visited July 18, 2007) (“A new era of experimentation on the basic cells of human life appears to be making science fiction into truth. Community and governments are sitting up and asking: why are scientists fooling around with human stem cells?”).

42. Meriam-Webster’s Online Dictionary, <http://www.m-w.com/dictionary/clone> (last visited July 18, 2007) (defining clone as “the aggregate of genetically identical cells or organisms asexually produced by a single progenitor cell or organism” or “an individual grown from a single somatic cell or cell nucleus and genetically identical to it” or “a group of replicas of all or part of a macromolecule and especially DNA”).

43. *Univ. of Mass. v. Roslin Inst.*, 437 F. Supp. 2d 57, 59 (D.D.C. 2006) (discussing the cloning of Dolly the sheep, out of which this court action alleging patent infringement arose).

44. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 48 (2006) (“By one count, out of 17,500 attempts at reproductive cloning in at least five mammalian species, 99.2 percent of the implanted embryos died *in utero*. Of those mammals that were born, many died soon after.”).

45. *See Missourians Against Human Cloning v. Carnahan*, 190 S.W.3d 451, 454 (2006) (discussing the appellant’s belief that somatic cell nuclear transfer constitutes “human cloning”).

cloning, while an hESC line makes cells with a potential for medical use—nothing more.<sup>46</sup> In theory, human cloning is possible through reproductive cloning, but laws prohibit this possibility due to the extreme biological problems and risks associated with this type of experimentation.<sup>47</sup> Human cloning cannot occur from an hESC line of cells because these cells, although embryonic in nature, are no longer within an embryo.<sup>48</sup> Thus, they cannot produce a baby (i.e., clone a human being).

#### D. *Female Bodily Rights*

Embryonic stem cells, as discussed earlier, come from embryos originating from the female reproductive system. The female reproductive system is the source of human life, and consequently, a woman's ownership and rights regarding her reproductive system remain the subject of long-standing debate.<sup>49</sup> In the United States, most federal and state laws allow a woman the freedom to choose how her body parts are used subject to certain limitations.<sup>50</sup>

#### E. *Embryos and the Right to Abort*

Society in general recognizes and respects embryos as a necessary part of the cycle of human life. The 1973 *Roe v. Wade* abortion decision,<sup>51</sup> coupled with the discovery of IVF, drew increased attention to embryos' rights in reproduction. However, embryos generally were not treated as humans, as there is no guarantee that an embryo will develop into a human being. In *Davis v. Davis*,<sup>52</sup> the Tennessee Supreme Court ruled that, in a custody dispute over the direction, use, or discarding of a couple's embryo, an embryo is neither a person nor property, but does demand special respect based on its capacity to become a person.<sup>53</sup> The Court also stated that the rights of those wishing to avoid procreation (those donating embryos) superseded the rights of the individual who

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46. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 55 (2006).

47. *Id.* ("Because of the many biological problems associated with animal cloning, any attempt to create a human would amount to the worst form of human experimentation.").

48. *Id.* ("An embryo in a culture dish [would] not produce a baby either, because it needs the environment of the uterus to survive.").

49. Women's International Center, *Women's History in America*, <http://www.wic.org/misc/history.htm> (last visited July 18, 2007) (discussing how a woman's "natural biological" role traditionally was regarded as a woman's "major social role").

50. *Id.* ("Today, contraception and, in some areas, legalized abortion have given women greater control over the number of children they will bear.").

51. *Roe v. Wade*, 410 U.S. 113 (1973).

52. *Davis v. Davis*, 842 S.W.2d 588 (Tenn. 1992).

53. *Id.* at 597 (describing the "interim category" preembryos occupy).

wished to procreate (those wanting the embryos).<sup>54</sup> In essence, those responsible for creating the embryo are also responsible for caring for it as long as the donor(s) or the embryo is alive.

A woman's right to choose to abort, or terminate, her pregnancy has been debated for centuries.<sup>55</sup> The fight for a woman's legal right to an abortion evolved over a number of years in American courts and continues to evolve today. In the landmark abortion decision, *Roe v. Wade*, the United States Supreme Court held under the Fourteenth Amendment, the word "person" in the Fourteenth Amendment did not include the unborn, thereby giving women the right to choose whether or not to abort, or terminate, their pregnancies.<sup>56</sup> The availability of the right to choose was based on a trimester system with more regulations as the baby developed during the pregnancy.<sup>57</sup> *Planned Parenthood v. Casey*<sup>58</sup> modified *Roe v. Wade* by throwing out the trimester system and allowing state regulation of abortions so long as state regulation did not create an undue burden on a woman's ability to obtain an abortion.<sup>59</sup> It is important to note that both of the United States Supreme Court decisions, along with other areas of the law, place a significant emphasis on a fetus's progression throughout the pregnancy. The Court's rationale is based on the theory that the further along in the pregnancy process, the more likely the fetus begins to progress, develop, and become more of a "person." For example, current tort law also places a premium on the amount of time a fetus has progressed; such progression represents an essential

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54. *Id.* at 604 ("If no prior agreement exists, then the relative interests of the parties in using or not using the preembryos must be weighed. Ordinarily, the party wishing to avoid procreation should prevail, assuming that the other party has a reasonable possibility of achieving parenthood by means other than use of the preembryos in question.").

55. Women's International Center, Women's History in America, <http://www.wic.org/misc/history.htm> (last visited July 18, 2007) ("Laws concerned with . . . abortion also displayed a bias against women . . . . In most states abortion was legal only if the mother's life was judged to be physically endangered.").

56. *Roe v. Wade*, 410 U.S. 113, 158 (1973) ("All this, together with our observation, *supra*, that throughout the major portion of the 19th century prevailing legal abortion practices were far freer than they are today, persuades us that the word 'person,' as used in the *Fourteenth Amendment*, does not include the unborn.").

57. *Roe*, 410 U.S. at 163–65 (delineating the state's interest in a woman's health during her pregnancy).

58. *Planned Parenthood of Se. Penn. v. Casey*, 505 U.S. 833, 833–34 (1992) (upholding the main principles of *Roe v. Wade*).

59. *Id.* at 874 ("Only where state regulation imposes an undue burden on a woman's ability to make this decision does the power of the State reach into the heart of the liberty protected by the Due Process Clause.").

element to determine whether wrongful death or wrongful life lawsuits are valid.<sup>60</sup>

Under current law, pregnant women are clearly free to control how their embryos (or stem cells) are treated during pregnancy. However, control of the treatment of the embryo, and thus stem cells, after aborted or discarded, is not as clear. The reason for the haziness revolves around trying to balance a number of issues: an ethical concern for the sanctity of life, the vast medical and research possibilities lying within embryonic cells and legal concerns over ownership of one's own body.

#### F. *Ownership of Body Parts*

Body tissue historically held value as a commodity that a person can use as they choose. In Shakespeare's *The Merchant of Venice*, a "pound of flesh" was offered as payment for debt.<sup>61</sup> In modern times, individuals donating eggs, blood, semen, or plasma may receive financial reimbursement for their donation. Any individual nationwide can legally designate where and how their body parts are used by giving their consent in legal documents such as wills and driver's license agreements.<sup>62</sup> While state laws vary on the level of consent required to donate organs, choosing to donate one's body parts is universally accepted and appreciated.<sup>63</sup>

The monetary value of bodily tissue continues to increase dramatically, especially during the current biotech era.<sup>64</sup> "A human egg can be worth

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60. HCA, Inc. v. Miller, 36 S.W.3d 187, 195 (Tex. App.—Houston [14th Dist.] 2000) (citing Brown v. Shwartz, 968 S.W.2d 331, 334 (Tex. 1998)). "Provided it is subsequently born alive, even an unborn fetus is a 'patient' to whom a doctor treating the mother owes a duty of care." *Id.*

61. WILLIAM SHAKESPEARE, *THE MERCHANT OF VENICE* act 3, sc. 3, available at <http://www.online-literature.com/shakespeare/merchant/15> ("These griefs and losses have so bated me, that I shall hardly spare a pound of flesh To-morrow to my bloody creditor.").

62. United Network for Organ Sharing, Glossary, <http://www.unos.org/resources/glossary.asp> (last visited July 18, 2007) (defining first person consent legislation as "[l]egislation that allows donor designation to be indicated on a driver's license or an official signed donor document, which gives hospitals legal authority to proceed with organ procurement without consent from the family").

63. MICHELE GOODWIN, *BLACK MARKETS: THE SUPPLY AND DEMAND OF BODY PARTS* 117–31 (2006) ("The Uniform Anatomical Gift Act gave license for the passage of presumed consent laws (also referred to as legislative consent laws) in 1987 through its most significant amendment . . . [which] permits the nonconsensual harvesting of body parts . . . [effectively allowing the nonconsensual harvesting of organs] through mandatory medical inquest or autopsy.").

64. Lori Andrews, *The Battle Over the Body: Some Uses of Human Tissue, Donated Before or After Death, Go Beyond the Donors' Consent*, 42 *TRIAL* 22, 22 (2006) ("A single cadaver can be mined for medical and research uses—its skin is worth \$36,522, its bones \$80,000, its tendons \$21,400, and so forth.").

tens of thousands of dollars” in the private market.<sup>65</sup> The value of a particular type of human gene can be worth billions of dollars.<sup>66</sup> These private and black market transactions are increasing in number and value, thus, creating profit generating opportunities for those in precarious positions, such as doctors and pharmaceutical companies.<sup>67</sup> The profit potential of human cells and tissue is only beginning to be addressed and understood in the legal system.<sup>68</sup>

In *Moore v. Regents of the University of California*,<sup>69</sup> a doctor and university researchers extracted various tissue samples from a patient throughout the course of his leukemia treatment without his consent.<sup>70</sup> The doctor used the patient’s tissue to patent a cell line and sold the rights for a substantial profit to a biotechnology firm.<sup>71</sup> Upon discovery, the patient, believing he legally owned his cells and tissue, immediately sued the doctors under thirteen separate causes of action, but the California Supreme Court only considered his first claim—conversion.<sup>72</sup> The Court found for the doctors and stated that since the patient’s cells were going to be discarded anyway, but were now furthering quality medical research, the patient had no basis for his conversion claim.<sup>73</sup> The Court noted, however, that the patient could make a claim under causes of ac-

65. *Id.*

66. *Id.*

67. MICHELE GOODWIN, *BLACK MARKETS: THE SUPPLY AND DEMAND OF BODY PARTS* 10 (2006).

68. Lori Andrews, *The Battle Over the Body: Some Uses of Human Tissue, Donated Before or After Death, Go Beyond the Donors’ Consent*, 42 TRIAL 22, 22 (2006) (“The legal system is beginning to address how human tissue is acquired, what it is used for, and how to protect people who receive it—whether as a transplant, a transfusion, a bone graft, an embryonic stem cell line, a gene therapy, or even a biotech pharmaceutical product.”).

69. *Moore v. Regents of the Univ. of Cal.*, 793 P.2d 479 (Cal. 1990).

70. *Id.* at 480-82 (outlining plaintiff Moore’s hairy-cell leukemia extensive surgical treatment). Throughout the diagnosis, the doctors advised Moore that surgical treatment was necessary to save his life. *Id.* at 481. As a result, Moore signed several consent forms to authorize surgical procedures; however, none of the forms asked Moore permission to use his cells for further research. *Id.*

71. *Id.* at 481-82 (adding that Moore’s doctor was listed as an inventor of the cell line when the patent was issued). After negotiations, Moore’s doctor received over \$300,000 over a span of three years and a share of his salary and benefits. *Id.* at 482.

72. *Id.* at 483 (“(1) ‘Conversion’; (2) ‘lack of informed consent’; (3) ‘breach of fiduciary duty’; (4) ‘fraud and deceit’; (5) ‘unjust enrichment’; (6) ‘quasi-contract’; (7) ‘bad faith breach of the implied covenant of good faith and fair dealing’; (8) ‘intentional infliction of emotional distress’; (9) ‘negligent misrepresentation’; (10) ‘intentional interference with prospective advantageous economic relationships’; (11) ‘slander of title’; (12) ‘accounting’; and (13) ‘declaratory relief.’”).

73. *See id.* at 493-97 (explaining that the application of tort law into the area of scientific research will impede research by restricting scientist’s access to “raw materials”).

tion for breach of fiduciary duty and lack of informed consent.<sup>74</sup> Thus, a physician must inform a patient of the use of any extracted cells and also gain the patient's consent if the physician's research benefits do not benefit the patient.<sup>75</sup>

In his dissent, Justice Mosk disagreed with the majority by stating the patient did have an "ownership interest" in his cells after they were removed from his body.<sup>76</sup> He explained that bodily parts and substances, including cells grown in vitro, are tangible personal property and the patient should be allowed to pursue a cause of action under the tort theory of conversion.<sup>77</sup>

The *Moore* decision's references to cellular lines and IVF reflect the complexities that arise regarding property rights of individual body parts. In fact, in *York v. Jones*,<sup>78</sup> the United States District Court for the Eastern District of Virginia noted that donated embryos can be the subject of a bailment, in which personal property may be delivered by a bailor to a bailee for a specific purpose.<sup>79</sup>

Numerous cases continue to discuss the importance of an individual's bodily rights, but the Sixth Circuit noted an interesting distinction in *Whaley v. Co. of Tuscola*.<sup>80</sup> In *Whaley*, a pathologist's assistant removed patients' eyes after autopsies and sold them.<sup>81</sup> The next of kin sued and

74. *Moore*, 793 P.2d at 483 (characterizing the cause of action as a "breach of a fiduciary duty to disclose facts material to the patient's consent" or "the performance of medical procedures without first having obtained the patient's informed consent").

75. *Id.* ("These principles lead to the following conclusions: (1) a physician must disclose personal interests unrelated to the patient's health, whether research or economic, that may affect the physician's professional judgment; and (2) a physician's failure to disclose such interests may give rise to a cause of action for performing medical procedures without informed consent or breach of fiduciary duty.").

76. *Id.* at 506, 510 (explaining that Moore retained valuable rights to do *whatever* he wanted with his own cells and tissue). Justice Mosk explained that Moore "could have contracted with researchers and pharmaceutical companies to develop and exploit the vast commercial potential of his tissue and its products." *Id.* at 510.

77. *Id.* at 509–10 (comparing Moore's property interest in his cells to other types of protected interests such as licenses).

78. *York v. Jones*, 717 F. Supp. 421, 424–27 (E.D. Va. 1989) (upholding plaintiffs' breach of contract claim involving the use of their pre-zygotes). In *York*, the plaintiffs, a husband and wife, sought the "release and transfer" of a pre-zygote from Jones Institute. *Id.* at 422. Pursuant to a Cryopreservation Agreement, the plaintiffs asserted a property interest in the right to transfer their pre-zygote. *Id.* at 424–25.

79. *Id.* at 425 (stating that the possession of a pre-zygote imposes a duty upon the Jones Institute under the Cryopreservation Agreement, which, in essence, constitutes a bailor/bailee agreement).

80. *Whaley v. Co. of Tuscola*, 58 F.3d 1111 (6th Cir. 1995).

81. *Id.* at 1113 (adding that the assistant continually removed autopsy patients' eyes without their families consent). In fact, in some instances, the next of kin outright refused to consent; however, the assistant continued to remove the autopsy patients' eyes. *Id.*

claimed they owned a “property interest” in their relative’s body under the Fourteenth Amendment’s Due Process Clause.<sup>82</sup> The Court agreed that the relatives had a constitutionally protected property interest in the dead body of a relative, especially given the brutality of such an act.<sup>83</sup> In fact, the Ninth Circuit delineated that relatives with such an interest include parents as shown in *Newman v. Sathyavaglswaran*.<sup>84</sup> Here, the Court held that parents have legitimate and exclusive property rights and are entitled “to possess, control, dispose, and prevent the violation of the corneas and other parts of the bodies of their deceased children.”<sup>85</sup>

### G. Patents

Patents involving cell lines and reproductive material create controversy and confusion as to who should actually own such material. As mentioned earlier, in *Moore*, the patient was concerned because the doctors used his genetic material to patent a cell line.<sup>86</sup> Such patents, given their impact on human development, are valuable. Demanding a royalty from anyone that uses the patented material creates large profits for the patent holders of such material.<sup>87</sup> While the origins of patents regarding physical inventions are relatively simple to figure out, the origins of patented biological processes can be harder to discern.<sup>88</sup>

To be patentable, an invention must possess certain subject matter elements. In the landmark case *Diamond v. Chakrabarty*,<sup>89</sup> the United States Supreme Court stated that natural discoveries are not patentable because these discoveries are “manifestations of . . . nature, free to all men.”<sup>90</sup> However, new discoveries existing only in a laboratory could be

82. *Id.* at 1112 (determining whether Michigan law establishes a protected property interest in the body parts of a deceased person).

83. *Id.* at 1117 (protecting the mutilation of a corpse under the Due Process Clause of the Fourteenth Amendment).

84. *Newman v. Sathyavaglswaran*, 287 F.3d 786, 796 (9th Cir. 2002) (agreeing with the Sixth Circuit).

85. *Id.* (explaining that these rights make up part of the right to transfer in the bundle of property rights).

86. *Moore*, 793 P.2d at 487 (detailing Moore’s claim to a proprietary interest in his cells and his patented cell line).

87. See Lori Andrews, Jordan Paradise, Timothy Holbrook, & Danielle Bochner, *When Patents Threaten Science*, 314 SCI. 1395, 1395 (2006) (describing how the patent holder of the first step in solving linear programming problems may demand royalties from engineers, planners, analysts, and other researchers).

88. *Id.* (explaining how natural genetic mutations may be patented as “predispositions to a disorder” due to their correlation).

89. *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

90. *Diamond*, at 309 (quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948)). In *Diamond*, the United States Supreme Court held that the Respondent’s micro-organism qualifies as a patentable product because it is not natural, but

patented.<sup>91</sup> Then, in 2006, *Laboratory Corporation of America Holdings v. Metabolite Laboratories*<sup>92</sup> showed the blurry line between natural discoveries and new laboratory-created discoveries.<sup>93</sup> The United States Supreme Court ignored precedent and allowed a commonly known law of nature to be patented.<sup>94</sup> The decision drew much criticism and created confusion regarding the patenting of scientific building blocks and ideas.<sup>95</sup>

#### H. Stem Cell Research Legislation

Analyzing legislative enactments regarding embryonic stem cell research reflect the divided, changing opinions of political parties, national institutes, and society over the last forty years. hESC research began in the 1970s in response to the discovery and interest regarding in vitro fertilization.<sup>96</sup> When the United States Supreme Court made abortion legal in 1973 with their landmark decision in *Roe v. Wade*,<sup>97</sup> public debate immediately ensued (and still does today). Pro-life supporters, religious leaders, and Congress worried of a black market for fetal tissue, embryos, and fertilized eggs.<sup>98</sup> By 1974, Congress established a moratorium banning research using fetal tissue and embryos formed through in vitro fer-

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rather a manufactured product. *Id.* On the other hand, in *Funk*, the United States Supreme Court held that bacteria cells did not qualify as patentable subjects due to their naturally occurring existence. *Id.* at 310.

91. *Id.* (describing the Respondent's discovery as a nonnaturally occurring phenomena).

92. *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 126 S. Ct. 2921 (2006) (per curiam).

93. *Id.* at 2926 (Breyer, J., dissenting) ("I concede that the category of non-patentable 'phenomena of nature,' like the categories of 'mental processes,' and 'abstract intellectual concepts,' is not easy to define."); see also *Parker v. Flook*, 437 U.S. 584, 589 (1978) ("The line between a patentable 'process' and unpatentable 'principle' is not always clear.").

94. See *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 126 S. Ct. 2921, 2927 (2006) (Breyer, J., dissenting) ("There can be little doubt that the correlation between homocysteine and vitamin deficiency set forth in claim 13 is a 'natural phenomenon.'").

95. Lori Andrews, Jordan Paradise, Timothy Holbrook, & Danielle Bochner, *When Patents Threaten Science*, 314 *Sci.* 1395, 1395 (2006) (highlighting the effects of the *Laboratory* decision in 2006 on scientific research).

96. See Kahyan Parsi, *Metaphorical Imagination: The Moral and Legal Status of Fetuses and Embryos*, 4 *DEPAUL J. HEALTH CARE L.* 703, 747 (1999) (discussing the concern surrounding the legal status of embryonic life).

97. *Roe v. Wade*, 410 U.S. 113, 153 (1973) ("This right of privacy, whether it be founded in the Fourteenth Amendment's concept of personal liberty and restrictions upon state action, as we feel it is, or, as the District Court determined, in the Ninth Amendment's reservation of rights to the people, is broad enough to encompass a woman's decision whether or not to terminate her pregnancy.").

98. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 151–52 (2006).



tilization.<sup>99</sup> In 1979, the Ethics Advisory Board (EAB) approved federal funds for embryonic research as ethical in relation to in vitro fertilization, but the NIH never acted on this recommendation.<sup>100</sup> By 1987, fetal cell transplantation was discovered and offered encouraging results when injected into the brains of Parkinson's patients.<sup>101</sup> In 1988, an NIH panel voted eighteen to three to allow both fetal and embryo research and claimed a clear distinction between the morality to treat disease with fetal tissue and the morality of abortion.<sup>102</sup> Nevertheless, undeterred by NIH's support of fetal tissue research to treat disease and the recent developments, Congress extended the moratorium to include a ban on fetal tissue transplantation research as well.<sup>103</sup>

In 1993, President Bill Clinton lifted this ban and turned to the Human Embryo Research Panel, formed by the NIH, to develop funding guidelines for embryo research.<sup>104</sup> These guidelines would allow embryo research to take into consideration the moral and ethical ramifications for such research.<sup>105</sup> The Panel recommended embryos should be used as early as possible for research purposes and allowed for cells to be donated by individuals or in vitro fertilization clinics with any surpluses.<sup>106</sup> However, Congress did not support the Panel's findings, and

99. Heather Boonstra, *Human Embryo and Fetal Research: Medical Support and Political Controversy*, 4 GUTTMACHER REP. ON PUB. POL'Y 1, 3 (2001) ("The 1974 National Research Act joined the two issues; among its provisions was a temporary moratorium on federally funded fetal research, 'before or after abortion.'").

100. *Id.* (adding that the EAB was disbanded in 1980); Christine L. Feiler, Note, *Human Embryo Experimentation: Regulation and Relative Rights*, 66 FORDHAM L. REV. 2435, 2459 (1998) (adding that additional EAB's were never created).

101. *Id.* ("The political environment changed dramatically in 1988, when scientists began experimenting with a new technique involving the transplantation of fetal cells and tissue into the brains of adults with Parkinson's disease . . . in which fetal tissue is not used simply as a research tool but as a source for cells and tissue for transplantation . . .").

102. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 153 (2006).

103. Heather Boonstra, *Human Embryo and Fetal Research: Medical Support and Political Controversy*, 4 GUTTMACHER REP. ON PUB. POL'Y 1, 3 (2001) ("This new development . . . prompted the Reagan administration to declare temporary moratorium on all federal funding for fetal tissue transplantation research.").

104. *See id.* at 4 (indicating that the NIH Revitalization Act allowed federal funding for early embryonic cells created through IVF); *see also* Marlene Cimons & Karen Birmingham, *Scientists Appeal to Revoke Funding Ban on Embryo Research*, 5 NATURE MED. 1, 6 (1999) (explaining Clinton's inability to lift an embryo research ban passed by congressional legislation).

105. *See id.* (explaining that federal funding for fetal tissue research is subject to certain conditions).

106. Christine L. Feiler, Note, *Human Embryo Experimentation: Regulation and Relative Rights*, 66 FORDHAM L. REV. 2435, 2460 (1998) (discussing the Panel's discouragement of the use of embryos fourteen days past fertilization).

federal funding for hESC research purposes was prohibited again by the Appropriation Act.<sup>107</sup> The Appropriation Act made the critical distinction that taxpayer money would not be used for research involving the destruction of embryos, thereby leaving only private funding as an option for hESC researchers.<sup>108</sup>

Nevertheless, President Clinton continued to look for ways to provide federal funding for embryonic research. In fact, when scientists discovered how to isolate and grow human stem cells in 1998, the NIH recommended a set of guidelines to allow and regulate embryonic research.<sup>109</sup> Accordingly, President Clinton formed the National Bioethics Advisory Commission, which advised Congress to lift the ban on fetal research and to keep research information in the public, not private, realm.<sup>110</sup> In 1999, President Clinton approved guidelines for a new system, allowing equal access for both private and public research, and in 2000, the NIH began accepting research grants, making a distinction between embryo and stem cell research.<sup>111</sup> In fact, on January 31, 2000, “Senators Tom Harkin and Arlen Specter introduced the Stem Cell Research Act,” which called for federal funding of embryonic research, but the bill never made it to a vote.<sup>112</sup>

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107. Department of Labor, Health and Human Services, and Education and Related Agencies Appropriations Act of 1998, § 513, Pub. L. No. 105–78, 111 Stat. 1467 (“None of the funds made available in this Act may be used for (1) the creation of human embryo or embryos for research purposes or (2) research in which a human embryo or embryos are destroyed, discarded, or knowingly subjected to risk of injury or death great than that allowed for research on fetuses in utero . . .”).

108. See CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 154 (2006); see also Department of Labor, Health and Human Services, and Education and Related Agencies Appropriations Act of 1998, § 513, Pub. L. No. 105–78, 111 Stat. 1467 (limiting the use of federal funds for human embryonic research).

109. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 154 (2006).

110. John C. Fletcher, *NBAC's Arguments on Embryo Research: Strengths and Weaknesses*, *THE HUMAN EMBRYONIC STEM CELL DEBATE* 61, 67 (Suzanne Holland, Karen Lebacqz & Laurie Zoloth, eds., MIT Press 2001) (discussing the politics surrounding the embryonic research debate). The NBAC proposed eight reasons, including in the name of science and for the sake of morality, why Congress should distinguish hESC research from fetal research. *Id.*

111. Kyla Dunn, *The Politics of Stem Cells*, <http://www.pbs.org/wgbh/nova/science-now/dispatches/050413.html> (last visited July 18, 2007) (explaining how since hESCs are not human embryos in the statutory sense, then federal restrictions under the Dickey-Wicker Amendment did not apply to them).

112. See Letter to Senate on “Stem Cell Research Act,” <http://www.usccb.org/prolife/issues/bioethic/keeler0300.shtml> (last visited July 18, 2007) (commenting on the NIH’s proposal as unethical and illegal); see also *Archived Stem Cell Research and Legislation*, <http://www.usccb.org/prolife/issues/bioethic/keeler0300.shtml>

On August 9, 2001, President George W. Bush's administration reinstated the moratorium on federal funding of hESC research, again halting the progress of hESC research.<sup>113</sup> President Bush took a seemingly firm stance on his opposition to embryonic research by stating in 2005, "[t]o build a culture of life, we must also ensure that scientific advances always serve human dignity, not take advantage of some lives for the benefit of others."<sup>114</sup> However, the 2001-reinstated moratorium still allowed some embryonic research if certain criteria were met:

1) "The derivation process (which begins with the destruction of the embryo) was initiated prior to 9:00 P.M. EDT on August 9, 2001."<sup>115</sup>

2) "The stem cells must have been derived from an embryo that was created for reproductive purposes and was no longer needed."<sup>116</sup>

3) "Informed consent must have been obtained for the donation of the embryo and that donation must not have involved financial inducements."<sup>117</sup>

On July 19, 2006, President Bush vetoed a bill, which passed in both the House and the Senate to allow federal funding for hESC research.<sup>118</sup> The veto drew criticism from Democrats, Republicans, and scientific experts.<sup>119</sup> President Bush responded to this criticism in a presidential address in which he outlined his views on hESC research.<sup>120</sup> In his address,

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[/stemcells.nih.gov/policy/legislation/archave.asp](http://stemcells.nih.gov/policy/legislation/archave.asp) (last visited July 11, 2007) (summarizing the main provisions of the Act).

113. Scott Davison, *Influencing NIH Policy Over Embryonic Stem-Cell Research: An Administrative Tug-of-War Between Congress and the President*, 22 J. NAT'L ASS'N ADMIN. L. JUDGES 405, 410 (2002) (outlining the requirements surrounding federal funding for embryonic stem cell research). Ironically, the requirements parallel the original NIH requirements surrounding embryonic stem cell research a year earlier. *Id.*

114. George W. Bush, President of the United States, State of the Union Address (Feb. 2, 2005), available at <http://www.whitehouse.gov/news/releases/2005/02/20050202-11.html> (adding an effort to work with Congress to prevent the creation and use of embryos for experimentation).

115. National Institutes of Health, Stem Cell Information: Federal Policy, <http://stemcells.nih.gov/policy/> (last visited July 18, 2007).

116. *Id.*

117. *Id.*

118. GovTrack.us. H.R. 810—109th Congress (2005): Stem Cell Research Enhancement Act of 2005, <http://www.govtrack.us/congress/bill.xpd?bill=H109-810> (last visited July 18, 2007) (tracking all legislative history surrounding H.R. 810 in the 109th Congress).

119. See Kerry A. Dolan, *Despite Bush Veto, Stem Cell Research Abounds*, FORBES.COM, July 21, 2006 [http://www.forbes.com/technology/2006/07/21/stem-cell-research-cz\\_kd\\_0721stemcell.html](http://www.forbes.com/technology/2006/07/21/stem-cell-research-cz_kd_0721stemcell.html) (noting that stem cell research should continue with private funding in light of Bush's recent veto).

120. See George W. Bush, President of the United States, President Discusses Stem Cell Research Policy (July 19, 2006), available at <http://www.whitehouse.gov/news/releases/2006/07/20060719-3.html> (addressing recent criticism surrounding his presidential veto of a stem cell bill).

President Bush explained that authorizing federal funds for embryonic stem cell research for new hESC lines devalues human life and leads to a series of moral hazards, like cloning, which are against the goals of “our Creator.”<sup>121</sup> He also added that he understood the importance of stem cell research and the immense possibilities regarding its findings that could lead to incredible medical advances.<sup>122</sup> For those reasons, he authorized more funding to research involving adult stem cells and the existing lines of embryonic stem cells.<sup>123</sup>

Regarding hESC research, the reinstated moratorium allows for research of new lines of stem cells, but only with private funds and subject to state discretion.<sup>124</sup> Moreover, the 2006 veto has not resolved debates among state legislatures, including Texas.<sup>125</sup> President Bush furthered the moratorium on June 20, 2007 by vetoing another bill proposing federal funding of hESC research.<sup>126</sup> As a result, hESC research efforts remain heavily reliant on private funding subject to state discretion.

121. *Id.*

As science brings us ever closer to unlocking the secrets of human biology, it also offers temptations to manipulate human life and violate human dignity. Our conscience and history as a nation demand that we resist this temptation. America was founded on the principle that we are all created equal, and endowed by our Creator with the right to life.

122. *Id.*

Like all Americans, I believe our nation must vigorously pursue the tremendous possibility that science offers to cure disease and improve the lives of millions. We have opportunities to discover cures and treatments that were unthinkable generations ago. Some scientists believe that one source of these cures might be embryonic stem cell research . . . . Yet we must also remember that embryonic stem cells come from human embryos that are destroyed for their cells.

123. *Id.*

I believe that with the right techniques and the right policies, we can achieve scientific progress while living up to our ethical responsibilities. That’s what I sought in 2001, when I set forth my administration’s policy allowing federal funding for research on embryonic stem cell lines where the life and death decision had already been made.

124. *Id.* (noting that the restrictions only apply to federally funded embryonic stem cells and implying that private funding may still support new lines of embryonic stem cell research).

125. Peggy Fikac, *Stem Cell Research Vote Called Sneaky*, SAN ANTONIO EXPRESS-NEWS, Apr. 17, 2007, at A4 (discussing controversy surrounding an attempt to block state funding of embryonic stem cell research). Advocates for embryonic stem cells stress such a ban would “tie Texas’ hands if Congress or a future administration lifts” the federal ban. *Id.*

126. George W. Bush, President of the United States, President Bush Discusses Stem Cell Veto and Executive Order (June 20, 2007), available at <http://www.whitehouse.gov/news/releases/2007/06/print/20070620-8.html> (explaining the morality issues behind the use of embryonic stem cells and highlighting the success of adult stem cell research).

### I. *Current hESC Research Climate*

It is estimated that thousands of stem cell lines exist, but currently, only the seventy-eight lines found before the August 2001 presidential announcement are allowed for research.<sup>127</sup> Many of these lines, however, are exhausted, privately owned, or lack consent from their owners for use; as a result, only a limited number of stem cell lines are left available to the public for research.<sup>128</sup> There are currently only twenty-one stem cell lines federally approved in the research registry.<sup>129</sup> The NIH set up the National Stem Cell Bank, operated by the WiCell Research Institute under the direction of James Thomson, the “stem cell pioneer.”<sup>130</sup> The National Stem Cell Bank owns, researches, and provides assistance for researching thirteen of the twenty-one embryonic stem cell lines available.<sup>131</sup>

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127. United States Department of Health & Human Services, Fact Sheet: Embryonic Stem Cell Research, <http://www.hhs.gov/news/press/2004pres/20040714b.html> (last visited July 18, 2007) (adding that sixteen lines failed to grow into usable lines for research).

128. United States Department of Health & Human Services, Fact Sheet: Embryonic Stem Cell Research, <http://www.hhs.gov/news/press/2004pres/20040714b.html> (last visited July 18, 2007) (noting state and private funding may still support new lines of embryonic stem cells).

129. Joe Vanden Plas, *Nation's Only Stem Cell Bank Will Receive UC-San Francisco Cell Line*, WISCONSIN TECH. NETWORK, Sept. 19, 2006, <http://wistechnology.com/article.php?id=3331>.

The Madison-based National Stem Cell Bank has announced it will receive human embryonic stem cells from the University of California-San Francisco, giving it 13 of the 21 stem cell lines available on the federal registry . . . . The stem cell bank was established as the nation's first - and so far only - national stem cell bank by the National Institutes of Health. The purpose of the bank is to obtain, characterize, and distribute the 21 human embryonic stem cell lines approved for federally funded research. *Id.*

130. National Stem Cell Bank, About NSCB, <http://www.nationalstemcellbank.org/> (last visited July 18, 2007) (explaining the purpose of NSCB as a repository for embryonic stem cells); WiCell Research Institute, About Us, [http://www.wicell.org/index.php?option=com\\_content&task=blogsection&id=11&Itemid=148](http://www.wicell.org/index.php?option=com_content&task=blogsection&id=11&Itemid=148) (last visited July 18, 2007) (“Headquartered in Madison, Wisconsin, WiCell is a supporting organization of the University of Wisconsin-Madison, a world-leader in the area of hES cell research. Stem cell pioneer Dr. James Thomson, Ph.D., V.M.D., was the first to isolate hES cells and now serves as WiCell’s scientific director.”).

131. Joe Vanden Plas, *Nation's Only Stem Cell Bank Will Receive UC-San Francisco Cell Line*, WISCONSIN TECH. NETWORK, Sept. 19, 2006, <http://wistechnology.com/article.php?id=3331> (outlining NSCB’s purpose of distributing the remaining twenty-one embryonic stem cells).

Several universities responded by creating multimillion-dollar programs for stem cell research.<sup>132</sup> Yet, the monetary resources of these prestigious universities are only a drop in the bucket compared with the NIH's research budget of \$28.6 billion (of which only \$27 million goes annually to hESC research).<sup>133</sup> States, on the other hand, possess significantly larger medical research budgets. Several states, most notably California and New Jersey, created state-supported stem cell research facilities.<sup>134</sup> Other states, including Texas, are still in the deliberation process regarding their stance of stem cell research.<sup>135</sup>

### III. LEGAL ANALYSIS

#### A. hESCs are Not Persons

While human embryos are the source of human life, they are not considered citizens of the United States.<sup>136</sup> In *Davis v. Davis*, the Tennessee Supreme Court held that a human embryo, frozen in a fertility clinic, may be considered as property, but not as a person.<sup>137</sup> Moreover, the United States Supreme Court's decision in *Roe v. Wade* placed an emphasis on a trimester system to determine a woman's right to terminate her embryo, and thus, her pregnancy.<sup>138</sup> *Planned Parenthood of Southeastern Pennsylvania v. Casey* modified *Roe* to some extent,<sup>139</sup> but women still possess clear freedom to have an abortion.<sup>140</sup>

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132. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 170–71 (2006) (listing Stanford, University of California-San Francisco, Harvard, and Columbia).

133. *Id.*

134. *Id.* at 173 (“California, New Jersey, Missouri, Massachusetts, Illinois”).

135. *Id.* at 170–71 (“Connecticut, Florida, Kansas, Ohio, Louisiana, Missouri, Maryland, New York, Washington State, Wisconsin, and Texas”).

136. *See Davis*, 842 S.W.2d at 595 (“Nor do preembryos enjoy protection as ‘persons’ under federal law.”); *see also Roe*, 410 U.S. at 162 (“[T]he unborn have never been recognized in law as persons in the whole sense.”).

137. *Davis*, 842 S.W.2d at 597 (“We conclude that preembryos are not, strictly speaking, either ‘persons’ or ‘property,’ but occupy an interim category that entitles them to special respect because of their potential for human life.”). The Court continued that the plaintiffs held an ownership interest in the preembryos. *Id.*

138. 410 U.S. at 163–65 (outlining the state's interest in life based on fetal viability).

139. *Planned Parenthood of Se. Penn. v. Casey*, 505 U.S. 833, 833–34 (1992) (reaffirming the basic principles of *Roe v. Wade*).

140. *Id.*

[T]he rule of *stare decisis* require that *Roe's* essential holding be retained and reaffirmed as to each of its three parts: (1) a recognition of a woman's right to choose to have an abortion before fetal viability and to obtain it without undue interference from the State, whose previability interests are not strong enough to support an abortion prohibition or the imposition of substantial obstacles to the woman's effective right to elect the procedure; (2) a confirmation of the State's power to restrict abor-

Legal issues also arise later in a pregnancy when an embryo grows closer to full development. For example, the United States Supreme Court recently agreed to review the issue of partial birth abortions.<sup>141</sup> If the Court decides that fertilized embryos growing in a woman's reproductive system are not human beings until the later stages of a pregnancy, then frozen embryos and human eggs should not be considered human beings either. Furthermore, hESC lines, removed from an embryo, should not be considered human beings if they are extracted from either frozen embryos or human eggs. As stated earlier, hESCs alone have no opportunity to become a human being and are not considered "persons."<sup>142</sup>

### B. *hESCs are Patentable Subjects*

"[L]aws of nature, natural phenomena, and abstract ideas" are not patentable subject matter according to the California Supreme Court.<sup>143</sup> While stem cells, having an origin in the human body, seem unpatentable as natural objects, the courts and the U.S. patent office say otherwise in regard to cellular discoveries.<sup>144</sup> In *In re Bergy*,<sup>145</sup> the United States Court of Customs and Patent Appeals held that cultured cells were patentable subject matter.<sup>146</sup> The Court deemed the microorganisms patentable because they existed only in a laboratory and not on their own in nature.<sup>147</sup> In *Diamond v. Chakabarty*, the United States Supreme Court also held that cultured genetic bacteria were patentable material, because they were created by scientists in a laboratory.<sup>148</sup> Similarly, hESC lines,

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tions after viability, if the law contains exceptions for pregnancies endangering a woman's life or health; and (3) the principle that the State has legitimate interests from the outset of the pregnancy in protecting the health of the woman and the life of the fetus that may become a child.

141. National Right to Life Committee, U.S. Supreme Court Agrees to Review Federal Partial-Birth Abortion Ban, [http://www.nrlc.org/press\\_releases\\_new/Release022106.html](http://www.nrlc.org/press_releases_new/Release022106.html) (last visited July 18, 2007).

142. *Davis*, 842 S.W.2d at 597 (commenting on the unique status of preembryos).

143. *Diamond v. Diehr*, 450 U.S. 175, 185 (1981) (recognizing the limits of patenting natural phenomena).

144. *See Diamond v. Chakrabarty*, 447 U.S. 303, 317–18 (1980) (upholding a patent of organisms produced from genetic engineering); *see also In re Bergy*, 596 F.2d 952, 973 (C.C.P.A. 1979) (upholding the patent of a microbiological process).

145. *In re Bergy*, 596 F.2d 952 (C.C.P.A. 1979).

146. *Id.* at 973 (defining the scope of patentable material).

147. *Id.* at 974 (describing the patentable subjects as industrial processes).

148. *Diamond v. Chakrabarty*, 447 U.S. 303, 309–10 (1980) ("Judged in this light, respondent's micro-organism plainly qualifies as patentable subject matter. His claim is not to a hitherto unknown natural phenomenon, but to a nonnaturally occurring manufacture or composition of matter—a product of human ingenuity 'having a distinctive name, character [and] use.'").

once removed from an embryo, cannot exist outside the laboratory in nature.<sup>149</sup> Accordingly, as laboratory-created subjects, hESCs are patentable.

To be patentable under 35 U.S.C.A. § 101, an invention must meet three criteria: usefulness, novelty, and be nonobvious.<sup>150</sup> Because hESC lines cannot exist alone in nature and are discovered, cultured, and grown by scientists, hESC lines are subject matter that fall within the criteria of 35 U.S.C.A. § 101.<sup>151</sup> As a result, hESC lines are patentable property.

### C. *hESCs are Property*

In their most basic form, hESCs are the property of a woman carrying an embryo and are subject to her control.<sup>152</sup> Once donated for IVF or research however, legal ownership of hESCs becomes significantly more convoluted. As noted earlier, the only individuals who have legal ownership of hESC lines are a few research facilities and a large biotech corporation.<sup>153</sup> This is because research facilities (who receive federal funding) and biotech companies contain the money and research capabilities to successfully cultivate hESC lines. They acquire hESC lines, either directly or indirectly, from embryos donated to IVF clinics or eggs donated for somatic cell nuclear transfer (SCNT).

Informed consent is typically required when using cells for profit.<sup>154</sup> However, consenting women who are either interested in having a baby or contributing to others' pregnancies, most likely waive any rights to

149. *Davis*, 842 S.W.2d at 597 n.19 (stating that a preembryo has merely a 13–21% chance of survival if implanted into a woman).

150. 35 U.S.C.A. § 101 (“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”).

151. *Id.*

152. *Davis*, 842 S.W.2d at 597 (explaining that a woman has some ownership interest over her embryos).

153. Joe Vanden Plas, *Nation’s Only Stem Cell Bank Will Receive UC-San Francisco Cell Line*, WISCONSIN TECH. NETWORK, Sept. 19, 2006, <http://wistechnology.com/article.php?id=3331>; see also National Stem Cell Bank, About NSCB, <http://www.nationalstemcellbank.org/> (last visited July 18, 2007) (explaining the purpose of NSCB as a repository for embryonic stem cells); see also WiCell Research Institute, About Us, [http://www.wicell.org/index.php?option=com\\_content&task=blogsection&id=11&Itemid=148](http://www.wicell.org/index.php?option=com_content&task=blogsection&id=11&Itemid=148) (last visited July 18, 2007) (“Headquartered in Madison, Wisconsin, WiCell is a supporting organization of the University of Wisconsin-Madison, a world-leader in the area of hES cell research. Stem cell pioneer Dr. James Thomson, Ph.D., V.M.D., was the first to isolate hES cells and now serves as WiCell’s scientific director.”).

154. *Moore*, 793 P.2d at 483 (“[A] physician’s failure to disclose such interests may give rise to a cause of action for performing medical procedures without informed consent or breach of fiduciary duty.”).



profit by knowingly or unknowingly signing a disclaimer when donating their reproductive materials. Because of these concerns, ownership of embryonic material is beginning undergo closer scrutiny.<sup>155</sup> Technological breakthroughs are increasing the profit potential of embryonic material. Subsequently, many of those left out of the profit are requesting a reexamination of the intent and motives of those involved—donors, IVF clinics, and research facilities/firms.<sup>156</sup>

Regardless of whether hESC lines are owned by giant corporations, research facilities, or individuals, these cell lines originate from embryonic cells from a woman's reproductive system. Such an embryo is a woman's personal property. Moreover, a woman can terminate her pregnancy *even after stages where it is clear that the embryo is alive and near development*. Therefore, if a woman has the freedom to choose to terminate her pregnancy, thereby *possibly* ending a life, she should be able to choose how her discarded embryo should be treated. Like other organs, discarded embryos should be designated free from federal restriction.

As a matter of fact, restricting this freedom discriminates against a woman in how she can use her own bodily property. The Fourteenth Amendment's Due Process Clause mandates that every American citizen be free from deprivation of life, liberty, or property.<sup>157</sup> Moreover, restricting research regarding discarded embryos not only discriminates against the woman who donated it, but also those who may potentially receive it down the line. Further knowledge is needed regarding embryonic research for the benefit of those donating or receiving hESCs through IVF, research laboratories, universities, those suffering from disease, and the American economy in general.

#### D. *An Economic Analysis of hESCs*

The principles of economics help shed light on individual motivations and how these motivations interact in society.<sup>158</sup> In general, economics emphasizes an individual's role in a free-market system and the importance of maximizing benefits out of one's available resources.<sup>159</sup> In particular, the economic goal of property rights is to put resources to their

155. See Antonio Regaldo, *Ethical Concerns Block Widespread Patenting of Embryonic Advances*, WALL ST. J., Aug. 20, 2001, at B1 (comparing the patenting of human cells to human ownership).

156. Lori Andrews, *The Battle Over the Body*, 42 TRIAL 22, 22 (2006) (investigating the issues surrounding the human tissue industry).

157. U.S. CONST. amend. XIV, § 1.

158. RICHARD POSNER, *ECONOMIC ANALYSIS OF LAW* 3–4 (Aspen Publishers 6th ed. 2006) (1973) (describing economics as the theory of rational choices).

159. *Id.* (characterizing humans as maximizers of their "self-interests").

most valuable use.<sup>160</sup> An individual retains exclusive rights in his or her valuable resources and should be able to freely transfer these resources based on its value to the individual.<sup>161</sup> The idea of free bargaining leads to resources ultimately being maximized in society.<sup>162</sup>

This individualistic approach to property rights also applies to property rights of the human body.<sup>163</sup> In particular, restrictions on a person's right to negotiate their own bodily property rights is not only inefficient, but also harmful to society.<sup>164</sup> Accordingly, a pregnant woman should have the right to make decisions about her own body in order to maximize her resources. Restrictions on her personal decisions harm not only the individual, but also society.

In fact, our legal system tends to follow economic principles in relation to women's rights. For example, the decisions to participate in an adoption or have an abortion requires a cost and benefit analysis by a woman. While adoption is not only permitted, a pregnant woman may even have her pregnancy costs paid for by the adopting family.<sup>165</sup> Most importantly, like adoption, abortion is legal.<sup>166</sup> A pregnant woman can make the decision to terminate her pregnancy based on a number of factors. These situations reveal examples of how women are allowed to weigh various factors and make decisions regarding the use their reproductive systems.<sup>167</sup>

The same economic principles apply to stem cell donation. While there is not a ban on embryonic stem cell donation, there is definitely a restriction, preventing a maximization of available resources. The current legislation does not allow federal funding for any research on donated embryos except for the strains in existence when the laws were en-

160. Richard Posner, *Adoption and Market Theory: The Regulation of the Market in Adoptions*, 67 B.U. L. REV. 59, 71 (1987).

161. *See id.* (outlining the economics of placing children up for adoption by comparing adopted children to property).

162. *See id.* (describing the host of factors adoptive parents consider during the adoption process).

163. *See* Elisabeth M. Landes & Richard A. Posner, *The Economics of the Baby Shortage*, 7 J. LEGAL STUD. 323, 324 (1978) (describing the economics of the baby market).

164. *See id.* (describing the harmful effects of restrictions in a baby selling market).

165. Lin Titone, *Good News for Adoptive Parents*, ADOPTION.COM, <http://library.adoption.com/laws-legal-issues/good-news-for-adoptive-parents/article/248/1.html> (summarizing the tax credits available to adoptive parents).

166. *Roe*, 410 U.S. at 153 (legalizing a woman's right to an abortion).

167. *See* Elisabeth M. Landes & Richard A. Posner, *The Economics of the Baby Shortage*, 7 J. LEGAL STUD. 323, 339 (1978) (outlining the marginal costs associated with adoption).

acted.<sup>168</sup> As a result, the restriction on embryonic stem cell research use does not allow a woman to maximize her valuable resources. Limiting a woman's transferability and negotiability capability over her resources, in turn, also restricts medical researchers and society from maximizing the resources available to them.

#### E. *Respect for the Embryo*

President Bush believes an embryo deserves respect. This belief is also shared by his advisors as well as the scientific community and most Americans. While the Bush administration's belief in protecting embryos is relatively unquestioned, the methods of protection proposed by the 2001 ban remain in question. In order to properly protect embryos, fetuses, and human beings in general, more information needs to be known about the possibilities of embryonic research. The current usable embryonic stem cell lines available on the NIH registry for public knowledge and research originate from mouse cells.<sup>169</sup> Even though mouse cells are beneficial for research, their inapplicability to human beings limits their research value.<sup>170</sup> Many researchers further claim these current lines are worthless. In 2001, new technology assisted private and international researchers in the discovery of hESC lines formed from human cells. These new lines show more benefits not only for research, but also for applicability to human diseases.<sup>171</sup>

Numerous private research companies are nearing discoveries that would allow stem cell removal technology that averts the destruction of the embryo. In Massachusetts, a medical research laboratory claimed to have found a way to extract the stem cells from the embryo without damaging the embryo, but this procedure was later found to be unsuccessful.<sup>172</sup> More recently, a research center in Spain claims to be able to

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168. See Kerry A. Dolan, *Despite Bush Veto, Stem Cell Research Abounds*, FORBES.COM, July 21, 2006 [http://www.forbes.com/technology/2006/07/21/stem-cell-research-cz\\_kd\\_0721stemcell.html](http://www.forbes.com/technology/2006/07/21/stem-cell-research-cz_kd_0721stemcell.html) (summarizing the sleuth of research on adult stem cells).

169. See Celeste Biever, *US Stem Cells Tainted by Mouse Material*, NEW SCIENTIST, Nov. 2004, <http://www.newscientist.com/article.ns?id=dn6604>.

170. See *id.*

171. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 51–53 (2006).

172. Gareth Cook, *Stem-Cell Method Preserves Embryo: Mass. Lab Hopes to End Standoff*, BOSTON.COM NEWS, Aug. 24, 2006 [http://www.boston.com/news/science/articles/2006/08/24/stem\\_cell\\_method\\_preserves\\_embryo/](http://www.boston.com/news/science/articles/2006/08/24/stem_cell_method_preserves_embryo/) (“The new research, performed at the Worcester laboratories of the biotech firm Advanced Cell Technology, shows that a single cell from an early embryo can be used to generate embryonic stem cells.”). While the Bush administration noted the positive step, it reaffirmed Bush's position against federal funding for embryonic stem cell research despite this recent advancement. *Id.*

extract viable stem cells from dead embryos.<sup>173</sup> Also, more and more private research companies make far-fetched claims regarding new medical therapies from embryonic research based on different hESC lines than the NIH registry.<sup>174</sup>

These discoveries signal an even greater need for the federal government to intervene and centralize these experiments. Allotting federal funding to organize and maintain a centralized research system would allow more governmental knowledge and control over a controversial, but certainly beneficial subject. These private research groups are independently acting on these projects, and they are using numerous embryonic materials with limited funding and motives often driven by financial gain.<sup>175</sup> If the government is truly concerned about the embryo and human life, then it would allow federal funding on all possible stem cell lines to permit more governmental control and protection of the embryo.

#### F. *U.S. Status as Global Leader in Science and Medical Research*

President Bush, in his 2001 address on stem cells said, “[t]he United States has a long and proud record of leading the world toward advances in science and medicine that improve human life. And the United States has a long and proud record of upholding the highest standards of ethics as we expand the limits of science and knowledge.”<sup>176</sup> The United States historically has lead the world in scientific and medical research and, at the same time, weighed and considered moral and ethical issues relating to such research. The Bush administration’s ethical struggle regarding hESC research in regards to federal funding closely resembles past research and moral dilemmas.

In the 1970s, politicians and scientists expressed deep concern and hesitation regarding recombinant DNA research. Fears arose that, “tampering with DNA, the basic molecule of life, might accidentally lead to the

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173. Malcolm Ritter, *Stem Cells Made From “Dead” Embryo*, DISCOVERY NEWS, July 25, 2006, [http://dsc.discovery.com/news/2006/09/25/stems\\_he.html?category=health](http://dsc.discovery.com/news/2006/09/25/stems_he.html?category=health) (suggesting the use of such embryos may resolve ethical dilemmas).

174. See Michael Fumento, *Stunning Lies: “Embryo-Safe” Experiment Just Another Stem Cell Fraud*, AM. SPECTATOR, Sept. 12, 2006, <http://fumento.com/biotech/lanza.html> (remaining skeptical of research advancements); Emily Singer, *Regenerating Chicken Wings*, TECH., Nov. 22, 2006, [http://www.technologyreview.com/read\\_article.aspx?id=17821&ch=biotech](http://www.technologyreview.com/read_article.aspx?id=17821&ch=biotech) (“A method to regrow damaged wings in chicken embryos could shed light on how to regenerate limbs in other species—including humans.”).

175. Kerry A. Dolan, *Despite Bush Veto, Stem Cell Research Abounds*, FORBES.COM, July 21, 2006 [http://www.forbes.com/technology/2006/07/21/stem-cell-research-cz\\_kd\\_0721stemcell.html](http://www.forbes.com/technology/2006/07/21/stem-cell-research-cz_kd_0721stemcell.html).

176. George W. Bush, President of the United States, *President Discusses Stem Cell Research* (Aug. 9, 2001), available at <http://www.whitehouse.gov/news/releases/2001/08/20010809-2.html>.

creation of new, uncontrollable strains of disease-carrying bacteria.”<sup>177</sup> Based on recommendations from the Recombinant DNA Advisory Committee, the NIH adopted guidelines and recombinant DNA research began. This research identified the Human Genome Project, 1500 disease genes, DNA fingerprinting, and 130 drugs, including vaccines for hepatitis B and influenza.<sup>178</sup>

President Reagan’s administration struggled with how to handle the AIDS epidemic in the early 1980s. When HIV was first reported in 1981, President Reagan responded by saying “Those who live in sin shall die in sin,” implying that AIDS was a “gay” disease.<sup>179</sup> The disease proved to be much more than a “gay” disease, striking homosexuals and heterosexuals alike with veracity. Since that time, our country has spearheaded AIDS research and gained substantial control of the disease, bringing help to those suffering and dying of AIDS globally.

Accordingly, the ethical reservations regarding hESC research should not create restrictions on hESC research. Moral knee-jerk reactions occurred with AIDS and recombinant DNA research. However, once allowed, they provided Americans, the U.S. economy, and the world with an immense benefit. hESC research offers the same potential benefits, and the current restrictions concede this point to an extent by allowing the lines currently in existence to receive federal funding—thereby acknowledging that hESC research does show significant promise.

### G. A Recommendation

The stem cell debate is a controversial national issue. Discussions occur regularly in the media—newspapers, radio talk shows, and television series.<sup>180</sup> It also seems to be a hot-button issue with voters in elections,

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177. *DNA Research*, TIME, Aug. 15, 1977, <http://www.time.com/time/magazine/article/0,9171,915270,00.html?promoid=googlep> (“Scientists themselves sounded the first alarm when they began to fear that tampering with DNA, the basic molecule of life, might accidentally lead to the creation of new, uncontrollable strains of disease-carrying bacteria.”).

178. CHRISTOPHER THOMAS SCOTT, *STEM CELL NOW: FROM THE EXPERIMENT THAT SHOOK THE WORLD TO THE NEW POLITICS OF LIFE* 179–80 (2006) (citing Christopher Scott & Tom Maeder, *The Consequences of Restrictions on Human Stem Cell Research*, 1 ACUMEN J. OF SCI. 1, 36–45 (2003)).

179. Michael Bronski, *The Truth About Reagan and AIDS*, 17 Z MAG. 1 (2004) available at <http://zmagsite.zmag.org/Jan2004/bronski0104.html>.

180. See *Boston Legal: Can’t We All Get a Lung?* (ABC television broadcast Sept. 19, 2006) (dramatizing a situation in which a dying father exchanges his healthy lung for his daughter’s tuition paid in full). Shirley Schmidt exclaims the following:

“I have a nephew; he’s in college. During his semester break, he offered himself as a subject for medical research in exchange for money. This is legal. The woman who lives down the block from me had her eggs harvested so that another woman could have a baby. She did this in exchange for money. This is legal. People can sell their

and, if the Bush administration's stance stays the same, then the issue could continue to get hotter.<sup>181</sup> Countless scientific experts have begged for stem cell support.<sup>182</sup> The American public wants a change.<sup>183</sup> Congress has asked for a change.<sup>184</sup> Therefore, it is time for a change by allowing all hESC lines to be researched with the aid of federal funds.

First, the NIH registry for hESC lines, the National Stem Cell Bank, should be made open. The registry currently keeps a database of all hESC lines in existence since the 2001 moratorium that are valid and approved for federally funded research. Opening this registry would allow any hESC line discovered via public or private research to be recorded, stored, and registered. Large numbers of new hESC lines have been discovered through technological advances by private research in the United States and abroad. Allowing a more informed database allows U.S. researchers, legislators, and the general public access to a valid, international, and comprehensive database. Requiring information about these new hESC lines to be public aids the flow of research and reduces private research secrecy regarding patent and profit issues.

Second, hESC researchers should be allowed the freedom to apply for grants from the NIH for federal funding, regardless of whether their re-

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hair, their blood, their sperm. Legal. Our nation embraces the notion that we have the right to sell parts of ourselves, that we are free to make these kinds of decisions about our own bodies. Well, sort of. Certain parts we have no rights. But the truth is, organ sales are happening anyway. Would-you like a kidney? I can get you one in Brazil for \$3000, in the Philippines for \$1800. I can get you an Achilles tendon in South Korea for anywhere between \$200 and \$1200. Why does this black market exist? Because our current system of organ donation is woefully failing us. Sure, you can put your name on a list, along with 92,000 people who are left on the list each year. In the meantime, anyone who can circumvent the list is doing so. Families and friends donate directly. Police and firefighters have an informal network where they donate their organs to each other. And-for a stiff monthly fee, any patient can subscribe to a donor-matching website." *Id.*

181. Center for American Progress, *Stem Cells Figure Prominently in 2006 Election*, [http://www.americanprogress.org/issues/2006/11/stem\\_cell\\_election.html](http://www.americanprogress.org/issues/2006/11/stem_cell_election.html) (last visited July 18, 2007).

182. Nancy Gibbs, *Stem Cells: The Hope And The Hype*, TIME, Aug. 7, 2006, <http://www.time.com/time/magazine/article/0,9171,1220538,00.html> (quoting Douglas Melton, co-director of the Harvard Stem Cell Institute). Melton stated: "There are camps for adult stem cells and embryonic stem cells. But these camps only exist in the political arena. There is no disagreement among scientists over the need to aggressively pursue both in order to solve important medical problems." *Id.*

183. 54% Of U.S. Adults Support Embryonic Stem Cell Research, 37% Oppose It, Poll Says, MED. NEWS TODAY, Dec. 20, 2006, <http://www.medicalnewstoday.com/medicalnews.php?newsid=59300>.

184. Kerry A. Dolan, *Despite Bush Veto, Stem Cell Research Abounds*, FORBES.COM, July 21, 2006 [http://www.forbes.com/technology/2006/07/21/stem-cell-research-cz\\_kd\\_0721stemcell.html](http://www.forbes.com/technology/2006/07/21/stem-cell-research-cz_kd_0721stemcell.html).

search concerns an hESC line on the NIH registry. Currently, hESC research can attain federal funding only if it meets a list of requirements. As discussed earlier, these requirements are too restrictive and should be removed even if only for a short time. The stem cell debate began over thirty years ago, and those involved are not allowed unrestricted access to what these cells can actually do to regenerate tissue and combat disease. Federal funding for all lines of stem cells could possibly answer many questions about what embryonic stem cells can do and how they truly compare with current research regarding adult stem cells.

Third, if hESC research gains unrestricted access to cell lines, the recommendations of the previous presidential-appointed stem cell research advisory councils deserves attention in regards to human cloning. Animal and human cloning processes derive from Somatic Cell Nuclear Transfer (SCNT), a procedure that also aids in producing embryos from which to obtain stem cells. The ethical and biological risks regarding animal and human cloning is too high; these procedures should be banned. Yet, it is important to note, as these councils repeatedly requested,<sup>185</sup> that the process of human cloning and hESC are not related. hESCs, once removed from an embryo, cannot clone a human being.

Finally, the 2001 moratorium on stem cell research occurred based on a number of issues. However, the primary concern that arose revolved around the belief that the destruction of an embryo in order to extract embryonic stem cells was in fact destroying human life. Although experts do not classify embryos as persons or human beings, a solution exists to satisfy both sides of the stem cell debate —use those embryos discarded by fertility clinics.

Fertilization clinics are not only legal, but are lauded as a great asset to society. In vitro fertilization is a process that furthers life by allowing individuals who struggle with pregnancy a better chance of bringing healthy life into the world. The embryos used in this process further life, not restrict it. In order for one embryo to be successfully implanted and begin human development, multiple embryos are inevitably removed, and, at the discretion of the donor, are either frozen, donated, or discarded. Over 100,000 donated embryos are discarded every year in fertility clinics.<sup>186</sup> While current hESC research requires the destruction of the embryo in order to extract viable stem cells, discarded embryos from in vitro fertilization are being destroyed regardless of whether or not they can first be utilized for hESC research. The inevitable destruction of em-

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185. Tex. S.B. 56, 80th Leg., R.S. (2007) (proposing a ban on human cloning but furthering hESC research).

186. 147 CONG. REC. S 3552 (daily ed. Apr. 5, 2001) (statement of U.S. Sen. Tom Harkin).

bryos during the in vitro fertilization process creates a source for hESCs without destroying any embryos that were not headed for destruction anyway. Thus, acquiring embryos from this source does not end life, but instead actually has the possibility of assisting life through hESC research.

#### IV. CONCLUSION

Our laws reflect society's viewpoint that "life" does not begin until sometime during the pregnancy process. Embryos are the beginning point of life, but they are not a guarantee of life. What sets them apart from other cells also creates a demand for them—embryonic stem cells are undifferentiated. The fact that these cells have not decided what type of cell they are going to be hints that life has not officially begun at this stage, to say the very least.

The law allows an individual to self-direct their body parts, even reproductive body parts, for various uses of their choosing, one of which is scientific research. Individuals should have the right to donate their embryos to scientific research if they so choose. Restricting the property rights of an embryonic donor is discriminatory to all involved (embryonic donors, donees, hESC researchers, and those suffering from debilitating diseases possibly treatable through hESC research).

The discrimination and control over people's choices seems pointless. A steady supply of embryos for hESC research is currently being discarded in IVF clinics every day. Thus, supply, demand, and new technological breakthroughs clearly call for a centralized and open hESC research approach even for a limited time period to give the answers that courts, scientists, legislators, and individuals everywhere are seeking—thus ending the stem cell debate and beginning the process of creating stem cell solutions.