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The Intersection of Law and Medicine: The Case for Providing Federal Funding for Embryonic Stem Cell Research

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THE INTERSECTION OF LAW AND MEDICINE:
THE CASE FOR PROVIDING FEDERAL FUNDING FOR
EMBRYONIC STEM CELL RESEARCH

I. INTRODUCTION

In 1998, two separate biological research teams announced that they had made a breakthrough in stem cell research after isolating and removing stem cells from a human embryo.¹ This discovery led to much controversy, with the medical community hailing it as a major research breakthrough, and pro-life groups fiercely objecting because the procedure involved the destruction of a human embryo.² Around the same time as the breakthrough finding, medical researchers confirmed that the method for obtaining stem cells from human embryos required the destruction of the embryos.³ Despite moral and ethical objections, embryonic stem cell research has become a major vehicle to develop potential treatments for many life-threatening diseases.⁴

This Note discusses the current state of the U.S. policy on embryonic stem cell research. Part II provides a background of the science of stem cell research and an overview of current policies.⁵ Part III also discusses the U.S. government's policy decisions and proposals that have generated

1. See Alo H. Konsen, Note, *Are We Killing the Weak to Heal the Sick?: Federally Funded Embryonic Stem Cell Research*, 12 HEALTH MATRIX 507, 507 (2002) (explaining 1998 research breakthrough in which embryonic stem cells were first isolated and cultured). One team, led by John Gearhart at Johns Hopkins University, used gonad tissue of aborted fetuses to obtain stem cells. See Press Release, Johns Hopkins Medical Institute, Hopkins Research Team Cultures Long-Awaited Human Embryonic Stem Cells (Nov. 5, 1998), at <http://www.hopkinsmedicine.org/press/1998/NOVEMBER/981105A.htm> (explaining isolation of stem cells from aborted fetal tissue). The other team, led by James A. Thomson at the University of Wisconsin-Madison, used frozen embryos left over from in vitro fertilization procedures. See Terry Devitt, *Wisconsin Scientists Culture Elusive Embryonic Stem Cells*, WIS. WEEK (Nov. 5, 1998), at <http://www.news.wisc.edu/wisweek/view.msml?id=3327> (explaining isolation of stem cells from human embryos).

2. See Konsen, *supra* note 1, at 508 (discussing controversy and disagreement over moral correctness of stem cell research). For a discussion of the isolation and removal of stem cells from a human embryo, see *infra* notes 10-13 and accompanying text.

3. See Konsen, *supra* note 1, at 509 (acknowledging destruction of embryos to obtain stem cells). "Creating [embryonic stem] cell lines requires researchers to destroy an embryo." See *id.* (quoting Sabine Steghaus Kovac, *Ethical Loophole Closing Up for Stem Cell Research*, 286 SCI. 31 (1999)).

4. See University of Wisconsin, *Embryonic Stem Cell Fact Sheet* (Nov. 5, 1998), at <http://www.news.wisc.edu/view.html?id=3319> [hereinafter *Stem Cell Fact Sheet*] (explaining medical benefits of embryonic stem cell research).

5. For a discussion of the scientific processes and legal issues surrounding stem cell research in the United States, see *infra* notes 10-68 and accompanying text.

the controversy surrounding the research.⁶ Part IV presents arguments in support of embryonic stem cell research.⁷ In contrast, Part V examines the opposing arguments.⁸ Finally, Part VI proposes suggestions for future federal legislation governing this rapidly advancing area of medical research.⁹

II. BACKGROUND

A. Stem Cells

Stem cells are cells from the human body that are unspecialized, meaning that they are capable of becoming specialized types of cells, such as muscle or bone cells.¹⁰ Human stem cells are derived from two sources—human embryos and adult tissue.¹¹ Embryonic stem cells derive from the inner cell mass of human embryos that have been fertilized through in vitro fertilization.¹² The inner cell mass is spread over a petri dish where the cells continue to grow.¹³ Because the inner cell mass con-

6. For a discussion of the policy background behind the stem cell research controversy, see *infra* notes 69-101 and accompanying text.

7. For a discussion of the scientific, moral and legal arguments in support of a policy permitting embryonic stem cell research and providing funding for such research, see *infra* notes 102-26 and accompanying text.

8. For a discussion of arguments opposing a federal policy permitting embryonic stem cell research and providing funding, see *infra* notes 127-45 and accompanying text.

9. For a discussion of the conclusion that the United States should enact a policy permitting federally funded embryonic stem cell research and proposed model federal legislation, see *infra* notes 146-74 and accompanying text.

10. See National Institutes of Health, *Stem Cell Information*, at <http://stemcells.nih.gov/infoCenter/stemCellBasics.asp> (last visited Oct. 15, 2003) [hereinafter *Stem Cell Information*] (defining characteristics of stem cells).

11. See *id.* (explaining that human stem cells exist in both human embryos and adult tissue). Although stem cells can be obtained from both human embryos and the adult human body, each type has different characteristics. See *id.* (contrasting characteristics of embryonic and adult stem cells). Adult stem cells can be identified, isolated and retrieved from almost any organ or tissue in the body. See *id.* (discussing sources of adult stem cells). Whereas embryonic stem cells are grown and cultured in the laboratory, scientists are still trying to find ways to culture adult stem cells. See *id.* (explaining difficulty involved with culturing adult stem cells). Further, adult stem cells are far less numerous than embryonic stem cells. See *id.* (comparing occurrence of adult stem cells with occurrence of embryonic stem cells).

12. See *id.* (explaining sources of embryonic stem cells). In vitro fertilization (IVF) is a process in which eggs are removed from a woman's ovaries, fertilized with sperm and then implanted back into the uterus to artificially create a pregnancy. See American Society of Reproductive Medicine, *Fact Sheet: In Vitro Fertilization (IVF)*, at <http://www.asrm.org/Patients/FactSheets/invitro.html> (last visited Oct. 16, 2003) [hereinafter *IVF Fact Sheet*] (explaining IVF process). Couples who are unable to conceive a child naturally often undergo this procedure. See *id.* (discussing purpose of undergoing IVF).

13. See *IVF Fact Sheet*, *supra* note 12 (explaining early embryo development as related to stem cell removal process). Research has shown that the best age of an embryo to extract the inner cell mass to obtain stem cells is four to five days after

tains all of the cells of a developing embryo, the embryo ceases to develop when the mass is removed, causing the embryo to die.¹⁴

Once the inner cell mass is removed from the embryo, it is cultured and placed in specialized conditions that allow the cells to continue to divide and multiply.¹⁵ During this process, the cells are transferred several times to different petri dishes.¹⁶ This subculturation process is repeated for six months; after this point, if the cells have multiplied but have not become specialized, they become stem cell lines and are suitable for use in research.¹⁷ Although stem cells can also be obtained from adult tissue, researchers prefer to use embryonic stem cells instead of adult stem cells for three reasons: 1) embryonic stem cells are pluripotent, meaning they have the potential to differentiate into any of the specialized human cell types; 2) embryonic stem cells can be grown in large numbers in a controlled laboratory setting; and 3) embryonic stem cells exist in more abundant quantities than do adult stem cells.¹⁸

fertilization. *See id.* (discussing appropriate age to remove stem cells). This age is also referred to as the blastocyst stage. *See id.* (defining blastocyst). In the blastocyst stage, the human embryo consists of three elements: the trophoblast, a layer of cells that surrounds the embryo; the blastocoel, a hollow area inside the blastocyst; and the inner cell mass, a cluster of about thirty cells that exists in one part of the blastocoel. *See id.* (explaining development at blastocyst stage). This inner cell mass is removed from the blastocoel to obtain stem cells. *See id.* (explaining stem cell removal process).

14. *See id.* (discussing derivation of stem cells from human embryos). Because stem cells are actually removed from an embryo that is in between four and five days post-fertilization development, this results in the embryo no longer being able to give rise to a human fetus. *See Stem Cell Fact Sheet, supra* note 4 (explaining that, without the stem cells, embryo development ceases).

15. *See Stem Cell Information, supra* note 10 (explaining stem cell multiplication process). The process by which scientists create conditions that allow stem cells to divide and multiply is called subculturing. *See id.* (explaining subculturing process).

16. *See id.* (further detailing subculturing process). To promote cell growth, subculturing is performed several times during the development of stem cells that have been removed from the embryo for approximately six months after their derivation from the embryo. *See id.* (providing time period for subculturation).

17. *See id.* (explaining stem cell line development process). Stem cell lines must consist only of unspecialized cells. *See id.* (defining stem cell lines). If, during the subculturation process, the unspecialized cells begin to develop into specialized cells (a process called differentiation), they are no longer suitable for research. *See id.* (discussing properties of stem cell lines).

18. *See id.* (discussing advantages of using embryonic stem cells instead of adult stem cells for research). Embryonic stem cells are pluripotent, or able to differentiate into any type of cells. *See id.* (defining pluripotent). Because it is more advantageous to use pluripotent stem cells for research, embryonic stem cells are preferred over adult stem cells for research. *See id.* (explaining usefulness of embryonic stem cells). By contrast, adult stem cells are usually not pluripotent because they are found in specific body tissue that has already matured and specialized. *See id.* (contrasting embryonic with adult stem cells). In addition, the number of stem cells present in adult tissue is much lower than the number of stem cells that can be derived from embryos. *See id.* (discussing preference for embryonic stem cells).

B. *The Legal Status of Embryos—Property, Persons or Somewhere in Between?*1. *State Case Law*

Although case law surrounding the issue of the legal status of embryos is limited, some state courts have addressed the issue with respect to custody disputes over frozen embryos already in existence.¹⁹ These courts generally have adopted one of two views. Tennessee solely represents the minority view, as its high court is the only state court to hold that embryos are potential life and, thus, that the law should afford embryos special recognition.²⁰ The majority view, on the other hand, is that frozen embryos are the property of the progenitors.²¹

*Davis v. Davis*²² is the leading case illustrating Tennessee's position on the legal status of embryos. After lower courts grappled with the issue of the status of embryos for a period of time, the Tennessee Supreme Court concluded that embryos deserve "special respect" because they are potential human life.²³ *Davis* involved a dispute between a husband and wife (in the midst of a divorce) over the appropriate treatment of embryos that had been created and frozen through an in vitro fertilization procedure.²⁴ The embryos were extra eggs that had been collected from Mrs. Davis's

19. See, e.g., *A.Z. v. B.Z.*, 725 N.E.2d 1051, 1059 (Mass. 2000) (stating that individuals should not be compelled to become parents against their will by implantation of previously frozen pre-embryos); *J.B. v. M.B.*, 783 A.2d 707 (N.J. 2001) (upholding prior agreement as proper determination of disposition of excess embryos in event of divorce provided that neither party has changed its mind up to point at which embryos are to be discarded); *Kass v. Kass*, 696 N.E.2d 174, 176 (N.Y. 1998) (upholding in vitro fertilization agreement stating that, in event of divorce, unused frozen pre-zygotes would be "determined in a property settlement"); *Davis v. Davis*, 842 S.W.2d 588, 597 (Tenn. 1992) (stating that embryos are potential life and are entitled to "special respect"); *Litowitz v. Litowitz*, 48 P.3d 261, 269 (Wash. 2002) (rejecting argument that embryo should be called child).

20. See *Davis*, 842 S.W.2d at 598 (concluding that embryos are potential life).

21. See *Cahill v. Cahill*, 757 So. 2d 465, 467-68 (Ala. Civ. App. 2000) (holding embryos are property and contract law governs their disposition); *J.B.*, 783 A.2d at 719 (holding contract law should control disposition of frozen embryos); *Kass*, 696 N.E.2d at 180 (same).

22. See *Davis*, 842 S.W.2d at 597.

23. See *id.* ("We conclude that [embryos] 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."). Analyzing three possible ways to ascribe legal status to embryos—life, property or potential life—the Tennessee Supreme Court concluded that embryos occupied the third category of "potential life." See *id.* at 597 (explaining embryos had potential for life). The *Davis* court determined that the intermediate category of "potential life" was appropriate:

The preembryo is due greater respect than other human tissue because of [an embryo's] potential to become a person and because of its symbolic meaning for many people. Yet, it should not be treated as a person, because it has not yet developed the features of personhood, is not yet established as developmentally individual, and may never realize its biologic potential.

Id. at 596.

24. See *id.* at 591-92 (stating facts of case). While they were married, Mr. and Mrs. Davis turned to in vitro fertilization after they were unable to conceive a child.

ovaries and fertilized outside of her uterus, but had not been implanted in her uterus by the time of the divorce.²⁵

The Tennessee Supreme Court, affirming the lower appellate court ruling, awarded the embryos to Mrs. Davis.²⁶ The most significant aspect of the case, however, is the court's recognition that the proper legal status of embryos was an important issue.²⁷ The disagreement among the lower courts with respect to this issue is also significant.²⁸

The majority view, illustrated in the New York case of *Kass v. Kass*,²⁹ is contrary to Tennessee's position in that the majority view treats embryos more like property than persons. In *Kass*, the New York Court of Appeals

See id. at 592. Mrs. Davis underwent six egg removal and transfer procedures, but none resulted in a pregnancy. *See id.*

25. *See id.* at 591 (explaining in vitro and cryopreservation processes). At the time Mr. and Mrs. Davis divorced, Mrs. Davis had undergone a seventh IVF attempt, which again did not result in a pregnancy. *See id.* at 592 (stating facts). The remaining embryos that were not implanted were cryopreserved, but Mr. and Mrs. Davis divorced before another transfer procedure could be attempted. *See id.* (same).

26. *See id.* at 604 (affirming appellate court's decision). The appellate court's reliance on *York v. Jones*, 717 F. Supp. 421 (E.D. Va. 1989), as a basis of its decision to award the embryos to Mrs. Davis implied that the embryos were to be treated as property for the purpose of a divorce agreement. *See Davis*, 842 S.W.2d at 596 (citing *York*, 717 F. Supp. at 424-25).

27. *See Davis*, 842 S.W.2d at 595 ("One of the fundamental issues the inquiry poses is whether the [embryos] in this case should be considered 'persons' or 'property' in the contemplation of the law."). The court stated that it was important to decide the appropriate legal status of embryos for future cases. *See id.* at 596 (explaining need to give embryos legal status).

28. *See id.* (noting lower courts' disagreement). The trial court treated the embryos in question as persons, referring to the embryos as "children in vitro." *See id.* at 595 (explaining trial court's decision). The Court of Appeals took the opposite position, implying that the embryos were "property," and should be treated and divided as property interests in a divorce settlement. *See id.* at 596 (explaining appellate court decision).

The Supreme Court of Tennessee reached an intermediate conclusion. *See id.* at 597 (concluding that embryos occupied intermediate category of "potential life"). The court recognized that categorizing embryos as "persons" was plainly incorrect, citing Supreme Court precedent that has held that embryos are not entitled to the same legal rights and protections as persons. *See id.* at 595 (citing *Roe v. Wade*, 410 U.S. 113, 152 (1973), for proposition that fetuses do not possess individual rights); *see also Webster v. Reproductive Health Servs.*, 492 U.S. 490, 527-28 (1989) (O'Connor, J., concurring) (suggesting potential life exists at point at which fetus becomes viable). The *Davis* court thus reasoned that to classify an embryo as a person would have "vested them with legally cognizable interests separate from those of their progenitors," and that prior Supreme Court decisions prevented the vesting of such rights in an embryo. *See Davis*, 842 S.W.2d at 595 (reasoning that embryos are not persons under federal law).

Likewise, the *Davis* court concluded that the appellate court's treatment of the embryos as property was also incorrect because embryos were entitled to special respect due to their potential to develop into life. *See id.* at 597. The court relied upon this reasoning to support its determination that embryos occupied an interim category between property and personhood. *See id.* (reasoning embryos are potential life).

29. 696 N.E.2d 174 (N.Y. 1998).

faced the question whether to enforce a prior agreement providing for the disposition of embryos in the event of a divorce.³⁰ The consent agreement signed by Mr. and Mrs. Kass before the in vitro procedure provided that in the event of a divorce the “legal ownership” of the extra embryos was to be resolved as part of a “property settlement.”³¹ The issue in *Kass* was whether the consent agreement clearly expressed both parties’ intentions for the disposition of the extra frozen embryos.³² Applying basic principles of contract law, the court determined that if the consent agreement unambiguously expressed the parties’ intentions about the disposition of the embryos in a divorce situation, the consent agreement and its terms would control.³³

At the trial level, the New York Supreme Court held that the consent agreement should control because both parties clearly indicated their intentions for the disposition of the frozen embryos in a divorce situation.³⁴ The New York Court of Appeals affirmed, stating that Mr. and Mrs. Kass had clearly demonstrated their intentions, through the consent form, to allow any unused frozen embryos to be used for research.³⁵ In upholding the consent agreement, the *Kass* court treated the embryos as property to

30. *See id.* at 175 (detailing facts of case). During the course of their marriage, Mr. and Mrs. Kass learned that they could not conceive children naturally and decided to undergo in vitro fertilization. *See id.* at 175 (same). After several failed pregnancies, Mr. and Mrs. Kass elected to undergo the procedure again, this time first signing consent forms providing for the retrieval and fertilization of as many eggs as possible in the same procedure, and for the cryopreservation, or freezing, of extra embryos. *See id.* (same). The couple also signed an addendum to the consent form that authorized the in vitro clinic to use the embryos for research in the event that the couple no longer wanted to use the embryos to create a pregnancy. *See id.* at 177 (same).

Three weeks after signing the forms, Mr. and Mrs. Kass wrote a divorce agreement, which provided that the disposition of the frozen embryos would be governed by the consent form and subsequent addendum, and that neither Mr. nor Mrs. Kass would seek custody of the embryos. *See id.* (same). A month later, Mrs. Kass filed the present action for sole custody of the embryos so that she could use them to undergo another in vitro implantation procedure. *See id.* (describing procedural history). Mrs. Kass’s custody claim, however, was contrary to the terms in the consent agreement and addendum, which provided for the in vitro clinic’s release of the embryos to research. *See id.* (describing provisions in consent agreement and addendum).

31. *See id.* at 176 (discussing consent agreement). The relevant text of the prior disposition agreement provides:

Our frozen [embryos] will not be released from storage for any purpose without the written consent of both of us, consistent with the policies of the IVF Program and applicable law. In the event of divorce, we understand that legal ownership of any stored [embryos] must be determined in a property settlement and will be released as directed by order of a court of competent jurisdiction.

Id.

32. *See id.* at 180 (“The central issue is whether the consents clearly express the parties’ intent regarding disposition of the [embryos] . . .”).

33. *See id.* (holding contract law governed disposition of embryos).

34. *See id.* (analyzing content of consent agreement).

35. *See id.* at 182 (affirming New York Supreme Court’s holding).

be divided in the same manner as all other property in a divorce settlement.³⁶

Other state courts have cited *Kass* in deciding similar disputes.³⁷ Moreover, several legal scholars have emphasized the *Kass* approach in the disposition of frozen embryos in divorce cases.³⁸ The contractual mode of analysis in determining the disposition of embryos depends on the idea that they continue to be viewed as property.³⁹

A fairly recent Alabama case exemplifies a case in line with *Kass* and the majority view. In *Cahill v. Cahill*,⁴⁰ an Alabama court of appeals treated frozen embryos as property.⁴¹ The dispute in *Cahill* involved a custody battle over frozen embryos that were left over from an in vitro procedure.⁴² The Alabama Court of Appeals affirmed the trial court's ruling

36. See *id.* at 179 (stating that embryos are not persons). The court stated that there was no need to examine the issue of whether embryos are entitled to special protections greater than those provided to all other types of property. See *id.* (noting that facts of case do not implicate woman's right to privacy or bodily integrity). The consent agreement providing that the embryos were to be divided in a property settlement controlled here. See *id.* (indicating embryos are to be treated as property for legal ownership purposes); see also Konsen, *supra* note 1, at 524 (stating that *Kass* court "explicitly den[ie]d" that the [embryos] were people, defining them as something akin to property").

37. See *J.B. v. M.B.*, 783 A.2d 707, 713 (N.J. 2001) (citing *Kass*, 696 N.E.2d at 174) (holding that formal, unambiguous contract, if present, should control disposition of frozen embryos); *Litowitz v. Litowitz*, 48 P.3d 261, 266 (Wash. 2002) (citing *Kass*, 696 N.E.2d at 174) (concluding express agreement should control disposition of embryos).

38. See Christina C. Lawrence, *Procreative Liberty and the Preembryo Problem: Developing a Medical and Legal Framework to Settle the Disposition of Frozen Preembryos*, 52 CASE W. RES. L. REV. 721, 742 (2002) (arguing that "[i]f the couple cannot reach an agreement, the [embryos] should remain in storage until they are no longer viable . . ."); Noel A. Fleming, Comment, *Navigating the Slippery Slope of Frozen Embryo Disputes: The Case for a Contractual Approach*, 75 TEMP. L. REV. 345, 371 (2002) (arguing that "[t]he contract framework applied in *Kass* is a good example of how the contractual approach should operate").

39. See Konsen, *supra* note 1, at 524 (asserting that contractual approach used in *Kass* indicates court's view that embryos are property). Konsen also suggests that "twenty-eight years of abortionfriendly [sic] pronouncements from the U.S. Supreme Court" imply that most state courts view embryos as property, and not life. *Id.* at 525; see also *Kass*, 696 N.E.2d at 179 (stating that woman's right to privacy and bodily integrity are not implicated prior to implantation).

40. 757 So. 2d 465 (Ala. Civ. App. 2000).

41. See *id.* at 467 (discussing ownership of frozen embryos as between parties of lawsuit). The court viewed the issue as which of the parties had a property interest in the embryos, and not whether the embryos were property. See *id.* (assuming embryos were property). The court applied contract law principles to analyze a prior disposition agreement and to determine which parties may have acquired a property interest in the embryos. See *id.* at 467-68 (explaining analysis undertaken by court).

42. See *id.* at 465-66 (stating facts). After failing to conceive naturally, Mr. and Mrs. Cahill underwent an in vitro fertilization procedure at the University of Michigan. See *id.* (same). Six embryos resulted from the procedure, three of which were implanted in Mrs. Cahill's uterus and led to the birth of triplets and the other three of which were frozen for later use. See *id.* (same). Mr. and Mrs. Cahill subse-

that embryos are property, and the court stated that the embryos “shall not be the *property* of either party,” but rather that the university where the embryos were stored “appears to be the current owner of the [embryos].”⁴³ Looking to the agreement between Mr. and Mrs. Cahill and the university where the in vitro procedure was performed, the Alabama trial court viewed the embryos as property to be divided just like other marital property in a divorce settlement.⁴⁴

2. Federal Case Law

There is little federal case law that deals with the issue of the legal status of embryos; however, federal courts have examined the issue on a few occasions. In the landmark case of *Roe v. Wade*,⁴⁵ the U.S. Supreme Court concluded that there was no language in the Constitution that supported the view that life begins at conception.⁴⁶ The *Roe* Court analyzed

frequently divorced, and Mrs. Cahill then filed a motion seeking to have the three frozen embryos currently in storage at the University of Michigan awarded to her. *See id.* (describing procedural history).

In a counterclaim, Mr. Cahill contended that the embryos were not property, and thus should not be awarded as such to Mrs. Cahill. *See id.* (same). The trial court rejected Mr. Cahill’s argument and requested that both Mr. and Mrs. Cahill produce a copy of the agreement signed by the couple and the University before undergoing the procedure. *See id.* (same). Mr. Cahill complied with the request, but Mrs. Cahill was unable to produce the agreement. *See id.* (same). Consequently, the trial court held that the embryos remained the property of the University of Michigan. *See id.* (explaining trial court’s holding).

43. *See id.* at 467 (viewing embryos as property in its holding). The court stated that without Mrs. Cahill’s cooperation in producing a copy of the agreement—signed by her husband and the University of Michigan—the court could not decide whether Mr. or Mrs. Cahill were the owners of the embryos. *See id.* at 467 (attempting to look to agreement to determine which party had ownership rights to embryos). For this reason, the court held that the University of Michigan was the owner of the embryos. *See id.* (explaining holding).

44. *See* Jennifer L. Enmon, *Stem Cell Research: Is the Law Preventing Progress?*, 2002 UTAH L. REV. 621, 638 (explaining that holding in *Cahill* was representative of view that embryos are to be treated as property).

Florida has also used marital property principles to govern the disposition of frozen embryos in a divorce situation. *See id.* at 638-39 (treating embryos as property). In *Vitakis-Valchine v. Valchine*, a state appellate court used a divorce mediation agreement to decide which of the couple should receive embryos that the couple had previously frozen through an in vitro fertilization procedure. *See* 793 So. 2d 1094, 1099 (Fla. Dist. Ct. App. 2001) (explaining reliance on mediation agreement); Enmon, *supra*, at 638-39 (explaining reasoning in *Valchine* holding). The *Valchine* court treated the frozen embryos as property and relied on property division principles—here, those set forth in the divorce mediation agreement—to control awarding of the embryos. *See Valchine*, 793 So. 2d at 1099 (explaining court’s reasoning); Enmon, *supra*, at 639 (explaining court’s view of embryos as property to be divided by property settlement agreement).

45. 410 U.S. 113 (1973).

46. *See id.* at 162 (“In short, the unborn have never been recognized in the law as persons in the whole sense.”). The Supreme Court addressed the issue of whether a state violates a woman’s constitutional right by enacting legislation that criminalizes abortion. *See id.* at 129 (explaining issue presented in case). The Court also addressed the issue of whether a fetus was a person and, therefore,

the word “person” in each context as it appeared in the Constitution and concluded that from these contexts, the unborn were not persons for constitutional purposes.⁴⁷ The Court in *Roe* therefore concluded that the unborn did not have any constitutional right to life.⁴⁸

Another federal case that addressed the issue whether to categorize embryos as persons or property is *York v. Jones*.⁴⁹ In that case, the plaintiffs were a husband and wife who had undergone an in vitro fertilization process in Virginia.⁵⁰ A year after the procedure, they attempted to transfer the frozen embryo from the reproductive health center in Virginia, where the embryo was currently being stored, to a reproductive health center in Los Angeles, California.⁵¹ The defendant-clinic refused the Yorks’ transfer request.⁵² The Yorks argued that prior to undergoing the procedure, they had signed an informed consent form indicating that the embryo was their property, and that they could decide how to dispose of it in the event they did not want to implant it into Mrs. York’s uterus.⁵³

guaranteed a constitutional right to life. *See id.* at 156-57 (discussing whether fetus was person). In his concurrence, Justice Stewart echoed the view that embryos and fetuses were not yet “persons,” referring to a fetus as “the potential human life within her.” *Id.* at 170 (Stewart, J., concurring) (referring to fetus living in utero).

47. *See id.* at 157 (explaining constitutional analysis of “person”). The Court surveyed every instance in which the word “person” was referenced in the Constitution. *See id.* (noting all occurrences of “person” in Constitution). After this exhaustive inquiry, the Court concluded that “in nearly all these instances, the use of the word is such that it has application only postnatally. None indicates, with any assurance, that it has any possible prenatal application.” *Id.*

48. *See id.* at 156-57 (rejecting argument that fetus is guaranteed right to life under Due Process Clause). The Court expressly stated that the word “person,” as used in the Fourteenth Amendment, did not include the unborn. *See id.* at 158 (describing Court’s conclusions).

49. 717 F. Supp. 421 (E.D. Va. 1989).

50. *See id.* at 424 (stating facts of case).

51. *See id.* (stating facts and nature of dispute). Mr. and Mrs. York underwent an in vitro fertilization process, during which six eggs were removed from Mrs. York’s ovaries and fertilized. *See id.* (describing results of in vitro procedure). Five of the six resulting embryos were transferred to Mrs. York’s uterus, and the remaining embryo was cryopreserved by the reproductive health center in Virginia where the procedure was performed. *See id.*

52. *See id.* (stating facts).

53. *See id.* (stating facts). The informed consent form signed by the plaintiffs provided, in relevant part:

We may withdraw our consent and discontinue participation at any time without prejudice and we understand our [embryos] will be stored only as long as we are active IVF patients at The Howard and Georgeanna Jones Institute for Reproductive Medicine or until the end of our normal reproductive years. . . . Should we for any reason no longer wish to attempt to initiate a pregnancy, we understand we may choose one of three fates for our [embryos] that remain in frozen storage. Our [embryos] may be: 1) donated to another infertile couple . . . 2) donated for approved research investigation 3) thawed but not allowed to undergo further development.

Id.

In refusing to release the embryo, the reproductive health center argued that it was not required to transfer the frozen embryo because transferring the frozen embryo to another clinic was not an option specifically listed on the informed consent form that the Yorks had signed.⁵⁴ The district court rejected the clinic's argument, finding that the informed consent agreement signed by the plaintiffs "created a bailor-bailee relationship between the plaintiffs and defendants."⁵⁵ By analogizing the consent agreement between Mr. and Mrs. York and the reproductive health center to a bailor-bailee relationship, the *York* court determined that the embryo was to be treated as property.⁵⁶

Federal courts have also addressed the issue whether embryos have any legal rights of redress for injuries.⁵⁷ In *Doe v. Irvine Scientific Sales Co.*,⁵⁸ the U.S. District Court for the Eastern District of Virginia stated that embryos were not entitled to bring claims for injury in tort because embryos were "not entitled to the protections granted to persons."⁵⁹ *Doe* involved a class action lawsuit in which the plaintiffs alleged property damage and personal injury to frozen embryos that they had planned to store for later use.⁶⁰ The plaintiffs were instead forced to discard the frozen embryos due to the embryos' exposure to a potentially contaminated batch of Human Albumin, a manufactured product.⁶¹ The *Doe* court decided that because embryos were not persons for constitutional purposes,

54. *See id.* at 425 (explaining defendant's argument). Specifically, the defendant framed its defense in terms of plaintiffs' proprietary rights in the embryos, contending that such rights were restricted to those three options listed on the informed consent form. *See id.* (discussing Mr. and Mrs. York's property rights with respect to embryos).

55. *See id.* (explaining nature and creation of bailor-bailee relationship).

56. *See id.* (stating that in order for bailor-bailee relationship to form, "all that is needed 'is the element of lawful possession however created, and duty to account for the thing as the property of another that creates the bailment . . .'" (quoting *Crandall v. Woodward*, 143 S.E.2d 923, 927 (Va. 1965))).

57. *See, e.g.,* *Santana v. Zilog*, 95 F.3d 780, 786 (9th Cir. 1996) (holding non-viable fetus cannot bring wrongful death action); *Keith v. Daley*, 764 F.2d 1265, 1271 (7th Cir. 1985) (holding that state does not have legitimate interest in protecting potential life until fetus has become viable); *Doe v. Irvine Scientific Sales Co.*, 7 F. Supp. 2d 737, 742 (E.D. Va. 1998) (holding embryos are not entitled to recovery in tort).

58. 7 F. Supp. 2d 737 (E.D. Va. 1998).

59. *See id.* at 743 (holding embryos could not recover for injuries). Mr. and Mrs. Doe brought a class action suit against Irvine Scientific Sales Company, the manufacturer of a product called Human Albumin, which is used in in vitro fertilization procedures. *See id.* at 738 (describing procedural history of case). The product was recalled after certain batches were contaminated with Creutzfeldt-Jacob disease, a fatal neurological disease. Mrs. Doe underwent an in vitro fertilization procedure. *See id.* at 739 (stating facts). Some of the resulting embryos were implanted in her uterus and the rest were cryopreserved for later use. *See id.* (same). Because the frozen embryos had been exposed to the recalled Human Albumin, they had to be discarded. *See id.* (same).

60. *See id.* at 739 (stating facts).

61. *See id.* (stating facts).

“the embryos themselves [had] not suffered an actionable tort and Plaintiffs cannot bring such claim on their behalf.”⁶²

Another federal case, which contributes by analogy to the person-or-property embryo debate, is *Santana v. Zilog*.⁶³ In *Santana*, the U.S. Court of Appeals for the Ninth Circuit held that a nonviable fetus could not bring a wrongful death action.⁶⁴ The Ninth Circuit examined the views of other state courts concerning whether a fetus may recover for wrongful death.⁶⁵ The court stated that the view adopted by most state courts was that viable fetuses could recover for wrongful death, but that nonviable fetuses could not.⁶⁶ In adopting this majority view, the court noted that viability was a good measure to limit extension of wrongful death liability because “until that point the fetus is not capable of sustaining an independent, separate existence from its mother.”⁶⁷ This view applies by analogy to law governing embryos: because embryos are younger in developmental

62. *Id.* at 742 (emphasizing that under *Roe*, “embryos are not entitled to the protections granted to persons” (quoting *Roe v. Wade*, 410 U.S. 113, 158 (1973))). Mr. and Mrs. Doe subsequently brought a class action suit in negligence against Irvine Scientific Sales Co., claiming that Irvine’s failure to withdraw the product from the market or to warn of the potential contamination caused personal injury and property damage. *See id.* (detailing negligence claims against Irvine Scientific Sales Co.).

63. 95 F.3d 780 (9th Cir. 1996).

64. *See id.* at 786 (holding nonviable fetus may not recover for wrongful death). In this case, the plaintiffs sued defendant Zilog for wrongful death resulting from Mrs. Santana’s employment at Zilog. *See id.* at 781 (stating facts). While she worked for Zilog, a computer manufacturing facility, Mrs. Santana became pregnant and miscarried six times. *See id.* at 782 (same). She and her husband then sued Zilog for wrongful death of her six miscarried fetuses, alleging that Zilog had exposed Mrs. Santana to dangerous chemicals and did not warn her of the potential danger of the chemicals. *See id.* (stating nature of plaintiffs’ claim against Zilog).

65. *See id.* at 783 (discussing majority and minority views concerning whether nonviable fetus is entitled to cause of action for wrongful death).

66. *See id.* (discussing majority view that tort liability may not be extended to nonviable fetuses). At the time this case was decided, fifteen jurisdictions that allowed recovery in tort for viable fetuses declined to extend the liability to nonviable fetuses, and six jurisdictions did not recognize a cause of action in tort for either viable or nonviable fetuses. *See id.* at 783 n.3 (listing jurisdictions that did not allow nonviable fetus to recover in tort).

67. *See id.* (adopting majority view). The court analogized its reasoning to that used in other courts in determining the point at which a fetus becomes a person. *See id.* (“Courts use viability as the dividing line for ‘personhood’ because it denotes the point at which the fetus, in essence, becomes a person, or a ‘separate entity capable of maintaining an independent action in its own right.’” (quoting *Miller v. Kirk*, 905 P.2d 194, 197 (N.M. 1995))); *see also* *Thibert v. Milka*, 646 N.E.2d 1025 (Mass. 1995) (“There is no cause of action under [a] wrongful death statute for the death of a child who was not viable at the time of injury and was not born alive.”).

age than nonviable fetuses, embryos are *a fortiori* nonviable and, therefore, not able to bring a wrongful death action.⁶⁸

3. State Legislation Affecting Embryonic Stem Cell Research

Of the several states that have legislated on the issue of embryonic stem cell research, Louisiana is by far the most restrictive of the research.⁶⁹ Louisiana's statute defines an embryo that is not implanted in a woman's uterus as a "juridical person."⁷⁰ Louisiana prohibits the intentional use and destruction of embryos under any circumstances.⁷¹ Similarly, South Dakota prohibits all research on human embryos that subjects the embryos to "substantial risk of injury or death."⁷² South Dakota also prohibits the transfer of an embryo for use in research.⁷³ Minnesota has a

68. See National Institutes of Health, *Fetal Development*, at <http://www.nlm.nih.gov/medlineplus/ency/article/002398.htm> (last visited Oct. 11, 2003) (explaining that embryo becomes fetus at eight weeks post-fertilization).

69. See LA. REV. STAT. ANN. § 9:122 (West 2003) (prohibiting embryo research).

70. See *id.* § 9:123 ("An in vitro fertilized human ovum exists as a juridical person until such time as the in vitro fertilized ovum is implanted in the womb."). Thus, Louisiana treats embryos that are used for stem cell research as persons, and as such, those embryos are entitled to rights that are afforded to all other persons. See *id.*; see also Enmon, *supra* note 44, at 644 (explaining Louisiana's restrictive statute). Louisiana's statute is currently the only state statute that grants personhood status to embryos. See *id.* (recognizing Louisiana as only state to deem embryos persons).

71. See Enmon, *supra* note 44, at 644 (interpreting Louisiana Statute); see also LA. REV. STAT. ANN. § 9:129 (West 2003) (prohibiting destruction of embryos for any purpose). The statute provides:

A viable in vitro fertilized human ovum is a juridical person which shall not be intentionally destroyed by any natural or other juridical person or through the actions of any other such person. An in vitro fertilized human ovum that fails to develop further over a thirty-six hour period *except when the embryo is in a state of cryopreservation*, is considered non-viable and is not considered a juridical person.

Id. (emphasis added).

Cryopreserved embryos are expressly excluded from Louisiana's exception to its definition of nonviability. See *id.* (excluding frozen embryos from scope of statute); see also Enmon, *supra* note 44, at 644 (recognizing breadth of statute's prohibition of destruction of embryos).

72. See S.D. CODIFIED LAWS § 34-14-16 (Michie 2003) (prohibiting "nontherapeutic research that destroys a human embryo"); *id.* § 34-14-17 (prohibiting research that "subjects a human embryo to substantial risk of injury or death").

73. See *id.* § 34-14-17 (prohibiting "transfer [of] a human embryo with the knowledge that the embryo will be subjected to nontherapeutic research"). "Non-therapeutic" is defined as "research that is not intended to help preserve the life and health of the particular embryo subjected to risk." *Id.* § 34-14-19. South Dakota also prohibits research on cells obtained from destroyed embryos. See *id.* § 34-14-18. By enacting this statute, South Dakota has effectively prohibited the use of the existing stem cell lines for research, a step that even the President of the United States has not taken. See Enmon, *supra* note 44, at 645 (noting South Dakota has denied procedures approved by President for advancement of medical research); President George W. Bush, *Remarks by the President on Stem Cell Research* (Aug. 9, 2001), at <http://www.whitehouse.gov/news/releases/2001/08/20010809->

similar statute, which prohibits research on a human conceptus if the research is harmful to the conceptus.⁷⁴ In that statute, the term “human conceptus” includes an in vitro fertilized human embryo.⁷⁵ Despite Minnesota’s similar prohibition of only research that is harmful to the conceptus, the statute still prohibits embryonic stem cell research because researchers must destroy embryos in order to obtain the stem cells.⁷⁶

In contrast to the above statutory restrictions on research, New Hampshire enacted a statute that suggests that research and experimentation on embryos is legal.⁷⁷ In setting forth restrictions for the use of embryos, the statute provides, “[n]o [embryo] shall be maintained ex utero in the non-cryopreserved state beyond 14 days post-fertilization development” and also that “no [embryo] that has been donated for use in research shall be transferred to a uterine cavity.”⁷⁸ Because these restrictions do not prohibit research on embryos, New Hampshire implicitly permits research to be performed on embryos.⁷⁹ Furthermore, because there are no qualifications on the word “research” in the New Hampshire statute, one can persuasively argue that New Hampshire permits research that involves the destruction of embryos, such as stem cell research.⁸⁰

Pennsylvania’s embryonic research statutes are similar to those of New Hampshire.⁸¹ Pennsylvania’s statute is worded in such a manner that

2.html [hereinafter *Bush Remarks*] (permitting research on already created stem cell lines).

74. See MINN. STAT. ANN. § 145.422 (West 2002) (criminalizing research on human conceptus). The statute provides:

Subdivision 1. Penalty. Whoever uses or permits the use of a living human conceptus for any type of scientific, laboratory research or other experimentation except to protect the life or health of the conceptus, or except as herein provided, shall be guilty of a gross misdemeanor.

Subdivision 2. Permitted act. The use of a living human conceptus for research or experimentation which verifiable scientific evidence has shown to be harmless to the conceptus shall be permitted.

Id.

Obviously, the exception in subdivision 2 does not include embryonic stem cell research, because obtaining embryonic stem cells will result in the destruction of the embryo. See *Stem Cell Fact Sheet*, *supra* note 4 (noting destruction of embryo by removing stem cells).

75. See MINN. STAT. ANN. § 145.421(2) (West 2002) (defining human conceptus). Human conceptus is defined as “any human organism, conceived either in the human body or produced in an artificial environment other than the human body, from fertilization through the first 265 days thereafter.” *Id.*

76. See *Stem Cell Information*, *supra* note 10 (explaining process of harvesting stem cells from embryos and cessation of embryo development).

77. See N.H. REV. STAT. ANN. § 168-B:15 (2002) (providing restrictions, but not prohibitions, on use of embryos for research).

78. *Id.* (restricting use of embryos).

79. See *id.* (implying research on embryos is permitted under certain circumstances).

80. See *id.* (providing no qualifications of term “research,” thus implying that embryonic stem cell research is permitted).

81. See 18 PA. CONS. STAT. ANN. § 3213(e) (West 2003) (mentioning, but not prohibiting, experimentation on embryos). The statute provides, in relevant part:

demonstrates the state's acknowledgement and acceptance of embryo research activities.⁸² Recently proposed legislation supports this interpretation.⁸³ For example, in 2003 the Pennsylvania General Assembly proposed two bills, the Stem Cell Research Act and the Stem Cell Research Authorization Act.⁸⁴ Both bills authorize the use of embryos from donors who had leftover embryos from prior in vitro fertilization procedures and who had agreed to donate those embryos specifically for obtaining stem cells for research.⁸⁵

"All persons conducting, or experimenting in, in vitro fertilization shall file quarterly reports with the department." *Id.* Like New Hampshire's statute, the Pennsylvania statute suggests that embryo experimentation is legal in the state. *See id.* (declining to expressly prohibit embryo experimentation); N.H. REV. STAT. ANN. § 168-B:15 (restricting, but not expressly prohibiting, embryo research).

82. *See* 18 PA. CONS. STAT. ANN. § 3213(e) (suggesting experimentation on embryos is permitted as long as quarterly reports are submitted to appropriate state department). The statute thus implies that embryo research is not completely forbidden, provided that certain specific information is reported on a quarterly basis. *See id.* The information that the statute requires for the report is as follows:

- (1) Names of all persons conducting or assisting in the fertilization or experimentation process.
- (2) Locations where the fertilization or experimentation is conducted.
- (3) Name and address of any person, facility, agency or organization sponsoring the fertilization or experimentation except that names of any persons who are donors or recipients of sperm or eggs shall not be disclosed.
- (4) Number of eggs fertilized.
- (5) Number of fertilized eggs destroyed or discarded.
- (6) Number of women implanted with a fertilized egg.

Id.

83. *See* Stem Cell Research Act, H.R. 422, 187th Gen. Assemb., Reg. Sess. (Pa. 2003) [hereinafter Stem Cell Research Act] (proposing authorization of research on embryonic and adult stem cells donated by in vitro patients); *see also* Stem Cell Research Authorization Act, H.R. 945, 187th Gen. Assemb., Reg. Sess. (Pa. 2003) [hereinafter Stem Cell Research Authorization Act] (proposing authorization of embryonic stem cell research on embryos donated with consent from in vitro patients).

84. *See generally* Stem Cell Research Authorization Act, *supra* note 83 (listing date introduced to General Assembly as March 20, 2003); Stem Cell Research Act, *supra* note 83 (listing date introduced to General Assembly as February 25, 2003).

85. *See* Stem Cell Research Authorization Act, *supra* note 83, § 4(a) (providing for stem cell research on stem cells derived from embryos donated by in vitro patients); Stem Cell Research Act, *supra* note 83, § 3 (permitting "research involving the derivation and use of human embryonic stem cells"). Sections 5 (b) and (c) of the Stem Cell Research Act provide:

- (b) Individual Options.—Any individual to whom information is provided pursuant to subsection (a) shall be presented with the option of storing any unused embryos, donating them to another individual, discarding the embryos or donating the remaining embryos for research.
- (c) Written Consent.—Any individual who elects to donate embryos remaining after fertility treatments for research shall provide written consent.

Id.

4. *Federal Legislation on Embryo Research*

In response to recent developments, Congress passed an amendment to the Departments of Labor, Health and Human Service, and Education, and Related Agencies Appropriations Act of 1999; this amendment banned federal funding of embryonic research.⁸⁶ The amendment, passed in 2000 and codified as the Consolidated Appropriations Act of 2001, provides, in pertinent part:

None of the funds made available in this Act may be used for—
 (1) the creation of a 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 greater than that allowed for research on fetuses in utero under . . . section 498(b) of the Public Health Service Act (42 U.S.C. 289(g)(b)).⁸⁷

This proposed Act's companion bill, the Stem Cell Research Authorization Act, is more specific. Its text provides, in relevant part:

(b) Written determination.—A written determination signed by the progenitors that the embryo will never be implanted in utero and would otherwise be discarded is required [in order to donate embryo to research]. . . . Reasonable efforts must be made to contact the progenitors.

(c) Written consent.—After the determination under subsection (b), the written consent of the progenitors, if both are known, or the written consent of the female progenitor, if only one is known, must be obtained for embryo donation. If reasonable efforts to locate the progenitors fail, approval for embryo donation is presumed.

Stem Cell Research Authorization Act, *supra* note 83, § 4(b)-(c).

The Stem Cell Research Authorization Act contains a restriction not present in the Stem Cell Research Act. The former's restriction provides that "[h]uman embryonic stem cell research may not result in the creation of human embryos for reproductive purposes." *Id.* § 5.

86. See Consolidated Appropriations Act of 2001, Pub. L. No. 106-554, § 510(a), 114 Stat. 2763 (2000) (prohibiting funds under this Act for embryo research); see also Kosen, *supra* note 1, at 512 (predicting that House of Representatives will reintroduce similar version of Act when it is time to reconsider Labor, Health, and Human Services Appropriations Act). The language of the ban in the Consolidated Appropriations Act is likely to be used in future amendments to related laws. See *id.* ("The fetal research statute forbids research or experimentation on fetuses unless the activity enhances the well-being or meets the health needs of the fetus, or enhances the probability of its survival to viability; or will pose no added risk of suffering, injury, or death to the fetus.").

87. Consolidated Appropriations Act § 510(a) (noting prohibition of funding for embryo research). Section 510(b) of the Act defines a human embryo as "any organism . . . that is derived by fertilization, parthenogenesis, cloning, or any other means from one or more human gametes or human diploid cells." *Id.* § 510(b).

The Public Health Service Act prohibits research:

[O]n a nonviable living human fetus ex utero or a living human fetus ex utero for whom viability has not been ascertained unless the research or experimentation—

(1) may enhance the well-being or meet the health needs of the fetus or enhance the probability of its survival to viability; or

Thus, the current ban on human embryonic stem cell research effectively “extends to embryos the protections given to fetuses in the *United States Code* and the *Code of Federal Regulations*.”⁸⁸

The Department of Health and Human Services (DHHS) added to the growing controversy surrounding stem cell research when it issued an interpretation of the recently enacted ban on stem cell research.⁸⁹ The DHHS argued that the ban did not apply to embryonic stem cell research because the ban was based on the belief that embryos are life and pluripotent stem cells are not yet capable of independently sustaining life.⁹⁰ Thus, because pluripotent stem cells were used in embryonic stem cell research, embryonic stem cell research was not included in Congress’s ban on federal funding for embryo research.⁹¹

The Director of the National Institutes of Health (NIH) subsequently appeared before a Senate Appropriations Committee to testify as to the DHHS statement.⁹² In his address to the Senate, Director Harold Varmus supported the DHHS argument:

(2) will pose no added risk of suffering, injury, or death to the fetus and the purpose of the research or experimentation is the development of important biomedical knowledge which cannot be obtained by other means.

Public Health Service Act, 42 U.S.C. § 289g(a) (2003).

88. See Kosen, *supra* note 1, at 512 (explaining protections against research offered to fetuses under Public Health Service Act). The Consolidated Appropriations Act expressly applies the same risk standard to embryos as it does to fetuses—the research must pose “no added risk of suffering, injury, or death” in order to be eligible to receive federal funding. *Id.*; see also Consolidated Appropriations Act § 510 (a)(2) (explaining required risk standard for embryo research).

89. See Kosen, *supra* note 1, at 514 (explaining DHHS General Counsel’s statement of interpretation of ban on embryo research).

90. See *id.* (contending ban did not extend to embryonic stem cell research because pluripotent cells are not human organisms).

91. See *id.* (concluding that embryonic stem cell research was not included in congressional ban on funding for embryo research). The DHHS’s argument was based on moral grounds and formulated from the idea that “because pluripotent stem cells obtained from destroyed embryos were not morally equivalent to embryos themselves [in other words, the cells were not totipotent], ESCR [embryonic stem cell research] was exempt from the federal funding ban.” *Id.* at 515 (further detailing DHHS’s argument).

92. See Statement of Harold Varmus, NIH Director, before the Senate Appropriations Subcommittee on Labor, Health and Human Services, Education and Related Agencies (Jan. 26, 1999), at <http://stemcells.nih.gov/fedPolicy/statement.asp> (defending DHHS General Counsel’s statement of interpretation of ban on stem cell research). After providing a brief scientific background about the nature and purpose of embryonic stem cells and stem cell research, Mr. Varmus’s statement outlined the advantages to allocating federal funding of embryonic stem cell research. See *id.* (arguing for federal funding for embryonic stem cell research). According to Mr. Varmus, “the most important reason [for providing federal funding for embryonic stem cell research] is the fact that Federal involvement creates a more open research environment—with better exchange of ideas and data among scientists.” *Id.*

DHHS funds can be used to support . . . research utilizing human pluripotent stem cells because human pluripotent stem cells are not embryos. . . . By this definition . . . pluripotent stem cells are not and cannot develop into organisms. Therefore, human pluripotent stem cells are not embryos and are not covered by this prohibition on Federal funding.⁹³

5. *The NIH Guidelines*

In 2000, the NIH published guidelines for human stem cell research (the "Guidelines").⁹⁴ The Guidelines, aimed at regulating research on pluripotent stem cells, were created to provide a list of the required conditions for funding of research projects involving human embryonic stem cells.⁹⁵ Among other specifications, the Guidelines provide that federal funding will not be used "to derive human pluripotent stem cells from human embryos."⁹⁶ Interestingly, differing somewhat from Mr. Varmus's position in defense of the DHHS standard, the Guidelines include cells derived from human embryos in the definition of pluripotent stem cells.⁹⁷

93. *Id.* (describing DHHS opinion). Mr. Varmus stated that the DHHS opinion "relied on the broadly accepted science-based definition of organism: an individual constituted to carry out all life functions." *Id.* Mr. Varmus argued that pluripotent stem cells do not fit this definition because "pluripotent stem cells are not and cannot develop into organisms." *Id.*

94. *See* National Institutes of Health Guidelines for Research Using Human Pluripotent Stem Cells, 65 Fed. Reg. 51,976 (Aug. 25, 2000), *corrected by* 65 Fed. Reg. 69,951 (Nov. 21, 2000) [hereinafter Guidelines] (setting forth restrictions on embryonic stem cell research); *see also* Cynthia Donley Young, *A Comparative Look at the U.S. and British Approaches to Stem Cell Research*, 65 ALB. L. REV. 831, 846 (2002) (discussing creation of NIH Guidelines). The Guidelines' purpose for expressly prohibiting the derivation and research of stem cells from human embryos will be especially significant "when products from stem cell lines will be capable of transplantation into human subjects." *Id.* (explaining future significance of Guidelines).

95. *See* Guidelines, *supra* note 94, at 51,979 (explaining Guidelines' intended scope). The Guidelines are intended to apply to "the expenditure of National Institutes of Health (NIH) funds for research using human pluripotent stem cells derived from human embryos (technically known as human embryonic stem cells)." *Id.*

96. *See id.* (explaining ineligibility for federal funding if project involves deriving human pluripotent stem cells from human embryos). The Guidelines further state:

Studies utilizing pluripotent stem cells derived from human embryos may be conducted using NIH funds *only if* the cells were derived (without Federal funds) from human embryos that were created for the purposes of fertility treatment and were in excess of the clinical need of the individuals seeking such treatment.

Id. (emphasis added). The Guidelines define pluripotent stem cells as "cells that are self-replicating, are derived from human embryos or human fetal tissue, and are known to develop into cells and tissues of the three primary germ layers." *Id.*

97. *See id.* at 51,979 (defining pluripotent stem cells).

6. *The President's Declaration and Compromise*

In August 2001, President Bush gave a speech in which he announced a compromise—he would allow federal funding for research on existing embryonic stem cell lines.⁹⁸ A few weeks later, President Bush announced that federal funding would not be provided for the derivation of new embryonic cells, nor the creation of new stem cell lines.⁹⁹ President Bush's decision was consistent with his own religious and moral convictions, but was not necessarily based on any legal framework.¹⁰⁰ Despite widespread agreement that the President's compromise was at least a small step toward permitting embryonic stem cell research, critics have raised concerns about the efficacy of embryonic stem cell research in light of the finite supply of cell lines.¹⁰¹

98. See *Bush Remarks*, *supra* note 73 (“I have concluded that we should allow federal funds to be used for research on these existing stem cell lines, where the life and death decision has already been made.”). President Bush based much of his determination to provide federal funding for research on stem cell lines that were already in existence, but not to provide federal funding for the creation of new stem cell lines for future research, on his religious and moral convictions. See *id.* (explaining President's decision).

99. See National Institutes of Health (NIH), *Update on Existing Human Embryonic Stem Cells* (Aug. 27, 2001), at <http://stemcells.nih.gov/news/082701list.asp> [hereinafter *NIH Update*] (explaining Bush's decision not to allow federal funding for creation of new stem cell lines for embryonic stem cell research). The compromise that President Bush announced was not unexpected. Even those in favor of providing federal funding for all aspects of stem cell research conceded that the President's decision was not the worst possible—at least he left the door somewhat open for embryonic stem cell research to continue on a reduced level. See *id.* (discussing impact of President's compromise on future research).

100. See *Bush Remarks*, *supra* note 73 (“And while we must devote enormous energy to conquering disease, it is equally important that we pay attention to the moral concerns raised by the new frontier of human embryo stem cell research.”). See also Press Release, White House, Office of the Press Secretary, Fact Sheet: Embryonic Stem Cell Research (Aug. 9, 2001), available at <http://www.whitehouse.gov/news/releases/2001/08/20010809-1.html> (explaining President's rationale for compromise). It was widely acknowledged that the President's decision was “consistent with the President's belief in the fundamental value and sanctity of human life.” See *id.* (discussing President's moral views).

101. See Young, *supra* note 94, at 847 (discussing criticism of President's compromise). The President's compromise has generated some specific concerns. See *id.* at 847-48 (discussing concerns raised by President's compromise). One concern is that the number of available stem cell lines is too low for adequate research to be effectively performed. See *id.* (same). Another concern is that private companies in possession of some of the stem cell lines in existence might be unwilling to allow government funded researchers access to these existing lines. See *id.* (same). Additionally, some scientists are concerned because, by some estimates, the number of stem cell lines actually in existence and viable for use in research is much lower than the estimate on which the President relied in reaching his decision. See *id.* (same).

III. ARGUMENTS IN FAVOR OF FEDERAL REGULATION AND FUNDING FOR STEM CELL RESEARCH

Proponents of stem cell research have advanced several arguments in support of government funding of stem cell research.¹⁰² One argument is that the research provides medical advances and potential medical benefits that greatly outweigh the damage done by the destruction of embryos.¹⁰³ Research has shown that embryonic stem cells may provide treatments for many debilitating and terminal diseases, such as Parkinson's disease, Alzheimer's disease, multiple sclerosis, certain types of cancer, Lou Gehrig's disease and diabetes.¹⁰⁴ Many people who suffer from these diseases could stand to benefit.¹⁰⁵ Furthermore, stem cells may

102. See, e.g., Allison C. Ayer, *Stem Cell Research: The Laws of Nations and a Proposal for International Guidelines*, 17 CONN. J. INT'L L. 393, 414 (2002) (arguing embryonic stem cell research has great medical value); Erin George, *The Stem Cell Debate: The Legal, Political and Ethical Issues Surrounding Federal Funding of Scientific Research on Human Embryos*, 12 ALB. L.J. SCI. & TECH. 747, 791 (2002) (arguing that federal funding of embryonic stem cell research is necessary in order for United States to remain competitive in field of medical research and to treat debilitating diseases); Carly Goldstein, *Dipping into Uncle Sam's Pockets: Federal Funding of Stem Cell Research: Is It Legal?*, 11 B.U. PUB. INT. L.J. 229, 256 (2002) (arguing that federal funding of embryonic stem cell research would facilitate governmental regulation of stem cell research); Young, *supra* note 94, at 848 (arguing that United States should model embryonic stem cell research funding policy after Britain's more permissive embryonic stem cell research policy).

103. See George, *supra* note 102, at 791-92 (explaining potential scientific and medical benefits arising from stem cell research). Research shows that scientists will be able to use stem cells to generate new, healthy cells of some part of the human body and to use those cells to replace cells damaged by a particular disease. See *id.* (explaining mechanisms by which embryonic stem cells could cure disease). If stem cell research continues to progress, by some estimates, the resulting treatments could be tested on patients within two or three years. See *id.* at 792 (estimating when patient clinical trials for embryonic stem cell therapy may begin).

104. See *id.* at 792 (listing ailments for which embryonic stem cell research may provide treatment or cure); *Stem Cell Information*, *supra* note 10 (listing types of diseases that potentially can be treated and cured using stem cell therapy). The list of diseases that could possibly be cured by stem cell therapy also includes arthritis, AIDS, some types of heart disease, stroke and certain injuries such as burns and brain and spinal cord injuries. See *Stem Cell Information*, *supra* note 10 (specifying types of diseases that could be treated with embryonic stem cell therapy).

105. See George, *supra* note 102, at 792 (estimating number of people in United States afflicted with disease that embryonic stem cell research has potential to treat or cure, and explaining that high numbers of Americans suffer from these diseases); see also Food and Drug Administration, *Alzheimer's: Searching for a Cure*, at http://www.fda.gov/fdac/features/2003/403_alz.html (last visited Oct. 16, 2003) (estimating that four million Americans currently suffer from Alzheimer's disease); Mayo Clinic, *Multiple Sclerosis*, at <http://www.mayoclinic.com/invoke.cfm?id=ds00188> (last visited Oct. 16, 2003) (estimating that 400,000 Americans suffer from multiple sclerosis); National Institutes of Health, *Amyotrophic Lateral Sclerosis Fact Sheet*, at http://www.ninds.nih.gov/health_and_medical/pubs/als.htm (last visited Oct. 16, 2003) (estimating that 20,000 Americans suffer from ALS, also known as Lou Gehrig's disease); National Institutes of Health, *Diabetes Overview*, at <http://diabetes.niddk.nih.gov/dm/pubs/overview/index.htm> (last visited Oct. 16, 2003) (estimating that seventeen million people in United States suffer from dia-

eventually become a useful tool for testing pharmaceuticals and could provide a safer alternative to clinical trials of these drugs—trials that otherwise involve human subjects.¹⁰⁶

Another argument in support of providing federal funding for stem cell research is that the excess embryos will be destroyed and discarded completely if they are not used for research purposes.¹⁰⁷ Over one hundred thousand embryos are cryopreserved at fertility clinics throughout the United States, and the reality is that most of these embryos will never be transferred to a woman's uterus.¹⁰⁸ Thus, they will eventually be discarded.¹⁰⁹ Supporters of embryonic stem cell research argue that if the embryos are going to be discarded, using them for government-supported stem cell research is a more productive purpose.¹¹⁰

By funding stem cell research, the United States will likely remain competitive in a globalizing medical field.¹¹¹ This concern is particularly valid given the fact that some countries regulate stem cell research more liberally.¹¹² In light of these more permissive policies in other countries,

betes); National Institutes of Health, *Parkinson's Disease Backgrounder*, at http://www.ninds.nih.gov/health_and_medical/pubs/parkinson's_disease_backgrounder.htm (last visited Oct. 16, 2003) (estimating that at least 500,000 people in United States currently suffer from Parkinson's disease).

106. See George, *supra* note 102, at 792 n.360 (providing additional examples of usefulness of embryonic stem cell research); *Stem Cell Information*, *supra* note 10 (discussing alternative uses for embryonic stem cells, including testing of new drugs).

107. See Goldstein, *supra* note 102, at 254 (arguing that excess embryos that are not used for stem cell research will go to waste).

108. See *id.* at 254-55 (explaining cause of excess embryos from in vitro procedures). During a typical in vitro fertilization procedure, many eggs are removed from a woman and fertilized, but usually only three or four of the resulting embryos are placed back into her uterus. See *id.* (explaining in vitro procedure). The remaining embryos are often cryopreserved for future use, but there are usually far more embryos than would ever be needed for future in vitro procedures. See *id.* at 255 (explaining number of embryos resulting from in vitro procedure).

109. See *id.* (explaining problem of excess embryos). Women undergoing in vitro procedures are given a choice of whether to cryopreserve the excess embryos or to discard them. See *id.* Even women who choose cryopreservation eventually decide they do not want any more pregnancies, and the embryos are subsequently discarded. See *id.* (noting most excess embryos are ultimately discarded).

110. See *id.* at 255 (noting embryos will be destroyed anyway "and should be used to help people" (quoting Editorial, *Stem-Cell Research*, WINSTON-SALEM J., Aug. 27, 2000, at A, available at 2000 WL 27226151)).

111. See Enmon, *supra* note 44, at 624 ("[B]ecause research on human embryonic stem cells has been denied federal funding, human ES [embryonic stem] cell research has been hindered in the United States, which has lagged behind other countries' advances."); George, *supra* note 102, at 793 (explaining that allowing funding to use embryos for stem cell research would "revolutionize medicine").

112. See Young, *supra* note 94, at 848-49 (comparing U.S. policies on stem cell research with Britain's policy and discussing Great Britain's more permissive stem cell research policy). Because Great Britain allows scientists to obtain new stem cells and create new stem cell lines, Great Britain's approach to stem cell research is more permissive than the U.S. policy. See *id.* (arguing for more permissive embryonic stem cell research policy similar to Great Britain's policy); see also The

the United States could conceivably lose its competitive edge in certain areas of research.¹¹³ For example, Great Britain permits embryonic stem cell research in certain situations, such as where that research would lead to improved treatments for disease.¹¹⁴ Advocates of using embryonic stem cell research findings to cure diseases assert that American scientists are likely to move to Great Britain so as to continue this research.¹¹⁵ Simi-

Human Fertilisation and Embryology (Research Purposes) Regulations, 2001, SI 2001/188 at 2, available at <http://www.hmsa.gov.uk/si/si2001/20010188.htm> (last visited Nov. 15, 2003) [hereinafter Fertilisation Regulations] (governing issuance of licenses to research embryos); Young, *supra* note 94, at 848-49, (citing Human Fertilisation and Embryology Act, 1990, c. 37, §§ 3(3)(a), 3(1), 3(4) (Eng.) [hereinafter Fertilisation Act] (providing British government policy and regulations of embryonic stem research)). The British legislature justifies allowing scientists to create new stem cell lines because they believe the research is necessary for the advancement of medicine and treatments for diseases; and this medical advancement and the potential benefits it provides outweigh the fact that embryos will be destroyed in the process. See Young, *supra* note 94, at 852-53 (explaining British government's justification for embryonic stem cell research policy).

113. See Enmon, *supra* note 44, at 624 (asserting that lack of federal funding has resulted in United States having decreased ability to compete with other countries' advances in embryonic stem cell research). Also, not allowing scientists to extract new stem cells from embryos would result in the need to import stem cells from sources in other countries, which would be far more expensive and time consuming. See Young, *supra* note 94, at 852-53 (discussing concern about extra expenses that potentially could be incurred by not permitting embryonic stem cell research).

114. See Fertilisation Regulations, *supra* note 113 (providing circumstances in which embryonic stem cell research is permitted). The regulations allow licensing for stem cell research under the following circumstances:

- (a) increasing knowledge about the development of embryos;
- (b) increasing knowledge about serious disease or
- (c) enabling any such knowledge to be applied in developing treatments for serious disease.

Id.

These regulations, however, place some limits on the use of embryos for research. See *id.* For example, there must be written informed consent to the use of the embryos for stem cell research. See Young, *supra* note 94, at 849 (citing Fertilisation Act). The use of any embryo over fourteen days post-fertilization for research is prohibited. See *id.* Despite these limitations, the Fertilisation Regulations clearly address and permit stem cell research more permissively than the United States. See *id.* (discussing overall permissive nature of Fertilisation Regulations, despite limitations).

The British government justifies a more permissive stem cell research policy in order to ensure that British citizens benefit from the research as soon as possible. See *id.* (advancing reasoning for permissive embryonic stem cell research policy). To further this goal, British scientists must be able to readily derive stem cells from embryos, instead of relying on imported embryonic stem cells from other countries. See *id.* at 852-53 ("[R]equiring British scientists to import embryonic stem cells from other countries would make the research much more expensive and time-consuming and could lead to obstacles in the progress of potentially invaluable research.").

115. See Young, *supra* note 94, at 853 (stating concern over American scientists moving to Great Britain to do stem cell research because policy there is more permissive and funding is available). Despite the fact that the British policy on stem cell research is more permissive than the U.S. policy, the British scientific commu-

larly, China and Australia have policies that permit stem cell research to some extent.¹¹⁶

From a legal perspective, stem cell research should be permitted because embryos are not legal persons and, therefore, are not entitled to those protections afforded to persons.¹¹⁷ The Supreme Court expressed a clear opinion on this issue in *Roe v. Wade*.¹¹⁸ Additionally, most state courts that have addressed the issue have viewed frozen embryos as the property of their progenitors.¹¹⁹ In light of these decisions, embryos

nity is also concerned that British scientists who currently perform embryonic stem cell research will move to other countries that are even less restrictive than Great Britain. *See id.* (explaining British government's concern over losing scientists). This concern is advanced as one reason for Great Britain's permissive stem cell research policy. *See id.* (discussing reasoning behind Great Britain's embryonic stem cell research policy).

116. *See George, supra* note 102, at 770-71 (discussing Australia's and China's stem cell research policies). Chinese researchers have developed human brain stem cells that they plan to investigate for potential cures for Alzheimer's and Parkinson's diseases. *See id.* at 770 (discussing embryonic stem cell research under Chinese policy). Australia's government has long supported in vitro fertilization and is considering permitting embryonic stem cell research. *See id.* at 770-71 (outlining Australia's views on embryonic stem cell research).

Australia's policy on stem cell research is largely contained in the Infertility Treatment Act of 1995. *See Ayer, supra* note 102, at 409 (citing Infertility Treatment Act (1995) (Austl.)) (providing regulations of embryonic stem cell research in Australia). The Infertility Treatment Act provides that embryos may be used for research if the research itself is approved by the Australian government and if the conducting scientist is a doctor authorized by the government to perform such research. *See id.* (explaining Infertility Treatment Act). The Infertility Treatment Act restricts research to only those embryos that have been formed for treatment purposes, such as in an IVF procedure. *See id.* (analyzing Infertility Treatment Act's limitation on embryonic stem cell research).

117. *See Roe v. Wade*, 410 U.S. 113, 158 (1973) (concluding unborn are not persons); *York v. Jones*, 717 F. Supp. 421, 425 (E.D. Va. 1989) (treating embryos as property); *Kass v. Kass*, 696 N.E.2d 174, 182 (N.Y. 1998) (holding that in event of divorce, frozen embryos are to be donated according to consent agreement previously signed by couple); *Litowitz v. Litowitz*, 48 P.3d 261, 270-71 (Wash. 2002) (using contract law to decide parental rights to embryos).

118. *Roe*, 410 U.S. at 158 (finding that "the word 'person,' as used in the Fourteenth Amendment, does not include the unborn."). The Court referred to scientific articles that viewed conception as a "process over time, rather than an event." *Id.* at 161 (quoting Donald W. Brodie, *The New Biology and the Prenatal Child*, 9 J. FAMILY L. 391, 397 (1970)). The Court specifically referenced in vitro fertilization to illustrate this point. *See id.* (discussing medical view that life does not begin at conception). The Court acknowledged that any legal interest the State might have in protecting a fetus did not attach until the point at which the fetus became viable, which the Court defined as a period between twenty-four and twenty-eight weeks in gestational age. *See id.* at 160 (concluding nonviable fetus did not have right to life). Because the embryos used for stem cell research are at an age of four to five days post-fertilization, the question of viability will never be reached. *See Stem Cell Information, supra* note 10 (explaining age at which stem cells are removed from embryos for research).

119. For a discussion of courts' views of embryos as property, see *supra* notes 19-68 and accompanying text.

should be viewed as property.¹²⁰ Therefore, the argument that funding for stem cell research should be cut because embryos are entitled to extraordinary legal protection lacks precedential support.¹²¹

From an institutional standpoint, there are strong arguments in favor of the U.S. government's funding and regulating of stem cell research.¹²² By giving up its power to regulate stem cell research, the government could conceivably be opening the door to private companies' eventual "unsafe, black market operations" in the field of stem cell research.¹²³ If the government does not provide regulations on stem cell research, it is effectively "handing over its power to ensure that embryonic stem cell research is not abused."¹²⁴ Therefore, it is in the government's best interest to provide funding for stem cell research.¹²⁵ Moreover, Congress should fund stem cell research in order to utilize the regulatory power of federal agencies, which can effectively regulate its inevitable development.¹²⁶

IV. ARGUMENTS AGAINST FEDERAL REGULATION AND FUNDING FOR STEM CELL RESEARCH

There are several arguments against federal regulation and funding for stem cell research. One of the most prominent arguments derives from religious beliefs that life begins at conception, and, therefore, destroying embryos for the purpose of obtaining stem cells is murder.¹²⁷

120. For arguments in favor of the view that embryos are more like property than persons, see *supra* notes 29-68 and accompanying text.

121. See *Roe*, 410 U.S. at 158 (holding that "the word 'person,' as used in the Fourteenth Amendment, does not include the unborn"); *York*, 717 F. Supp. at 425 (treating embryos as property by holding embryos were subject matter of bailor-bailee relationship); *Kass*, 696 N.E.2d at 180 (concluding that contract principles should govern disposition of embryos).

122. See Goldstein, *supra* note 102, at 256 (noting concern created by federal government's refusal to regulate and fund stem cell research). Providing funding for stem cell research is critical, because providing funds also opens the door for the federal government to regulate stem cell research on a national level. See *id.* (articulating impact that providing funding of embryonic stem cell research would have on government's ability to regulate research).

123. See *id.* (presenting potential "parade of horrors" accompanying unregulated stem cell research).

124. See *id.* (discussing need for federal government to keep close regulatory eye on procedures and progress of stem cell research). By refusing to provide federal funding and regulation of stem cell research, there is a very real concern that the private companies who currently perform the research will disregard any safeguards or ethical concerns over the research, in the interest of continuing to make profits. See *id.* (discussing potential problems resulting from government's continued refusal to regulate embryonic stem cell research).

125. See *id.* (discussing need for federal funding for embryonic stem cell research).

126. See *id.* ("With the denial of federal funds to support pluripotent stem cell research comes the inability to regulate such embryonic sem [sic] cell research.")

127. See George, *supra* note 102, at 782 (explaining religious and pro-life groups' objections to embryonic stem cell research). Many religious and pro-life organizations are so staunchly opposed to the destruction of embryos that they

Those who oppose stem cell research on religious grounds believe that destroying one human life to help save many others is never justified.¹²⁸ For example, Roman Catholics advocate the position that every embryo “holds independent moral status and should have the same rights that all living people have.”¹²⁹

In an effort to promote alternatives to stem cell research, embryo adoption programs have been established in order to provide couples an option for disposing of the excess embryos without having them destroyed.¹³⁰ One of these programs, developed by Nightlight Christian Adoptions, uses traditional adoption procedures to match potential parents with donated embryos.¹³¹ The Snowflakes Embryo Adoption Program is designed to give embryos that would otherwise be thrown away a chance at “life.”¹³²

Another argument in opposition to stem cell research is that using embryos to obtain stem cells is simply unnecessary because there are other

have stated “some diseases are better than their cure[s].” *Id.* at 783 (quoting *Education and Related Agencies Holds Hearing on Stem Cell Research: Hearing on Stem Cell Research Before the S. Appropriations Comm., Subcomm. on Labor, Health and Human Servs.* (Sept. 14, 2000) (statement of Pastor Russell Saltzman), available at 2000 WL 1364369)).

128. See George, *supra* note 102, at 782-83 (explaining pro-life argument). To further this argument, “[r]eligious and pro-life leaders urge people to remember that we were all once embryos and fetuses.” *Id.*

129. See Ayer, *supra* note 102, at 399 (explaining Roman Catholic position that “when genetic material is joined there is a unique potential for life,” so embryos must be afforded same moral status as people). It is worth noting, however, that all religions do not embrace this view. See *id.* at 400 (explaining other religious teachings regarding moral status of embryos). Judaism dictates that embryos do not have any moral status until they have been implanted in the uterus for forty days. See *id.* (explaining Jewish teachings). Islamic tradition does not ascribe any status to embryos until an even later time of fetal development—the end of the fourth month of pregnancy. See *id.* (explaining Islamic teachings). Pursuant to these religions’ prescriptions, stem cell research does not present a moral dilemma with respect to the destruction of embryos because the cells are obtained about four to five days post-fertilization, well before either of these time periods. See *id.* (arguing that embryonic stem cell research does not violate teachings of all religions).

130. See Naomi D. Johnson, *Excess Embryos: Is Embryo Adoption a New Solution or a Temporary Fix?*, 68 BROOK. L. REV. 853, 871 (2003) (“For people who view life as beginning at conception, embryo adoption provides the only answer to the dispositional issue.”). One of the first private embryo adoption programs was developed by Nightlight Christian Adoptions. See *id.* at 859 (discussing embryo adoption programs).

131. See Snowflakes, *Message to Genetic Parents*, at <http://www.snowflakes.org/Genetic.htm> (last visited Oct. 16, 2003) (explaining Snowflakes Embryo Adoption Program). However, no state has developed a body of law regarding embryo adoption, but parents are required to sign the same binding relinquishment documents and adoption agreements as are adoptive parents of children, and these contracts are also binding upon the parties in an embryo adoption. See Johnson, *supra* note 130, at 860 (discussing legality of embryo adoption).

132. See Johnson, *supra* note 130, at 860-61 (discussing philosophy for embryo adoption program).

sources of stem cells that do not involve having to destroy any living cells.¹³³ Preliminary research has indicated that various tissues from the adult human body may be able to provide stem cells for eventual use in different types of therapy in many of the same respects as embryonic stem cells can.¹³⁴ The medical community, including the NIH, has responded to this argument by specifying the important differences between adult and embryonic stem cells.¹³⁵ Specifically, embryonic stem cells are available in much greater quantities, and are pluripotent, meaning that they are capable of differentiating into any cell in the human body.¹³⁶ According to the NIH, these aspects of embryonic stem cells make them more appropriate than adult stem cells for use in research and resulting therapies.¹³⁷ Nevertheless, the preference for embryonic stem cells over adult stem cells has been disputed, with some evidence suggesting that adult stem cells are just as effective as embryonic stem cells.¹³⁸ Therefore, according to some

133. See Konsen, *supra* note 1, at 535 (explaining other sources of stem cells for research). Some of the other areas of the adult human body where stem cells have been isolated and removed include the nervous system, muscle, certain parts of the eye, pancreas and bone marrow. See *id.* at 536 (listing sources of adult stem cells); see also *Stem Cell Information*, *supra* note 10 (explaining possible sources of adult stem cells). According to the NIH, stem cell research using adult stem cells has also been successful. See *id.* (explaining possibility of using adult stem cells for research). Moreover, research on adult stem cells is not a new development. See *id.* (discussing history of adult stem cell research). Forty years ago, studying adult bone marrow, scientists were able to identify two types of stem cells: (i) hematopoietic stem cells, which are the basis for all types of human blood cells and (ii) bone marrow stromal cells, which are the basis for bone, cartilage, fat and connective tissue. See *id.* (identifying two known types of adult stem cells). Stem cells taken from adult blood have already been used over the past thirty years as a basis for bone marrow transplants. See *id.* (noting relatively long history of bone marrow transplants for treatment of disease).

134. See *Stem Cell Information*, *supra* note 10 (identifying examples of treatment shown to be effective by preliminary research on adult stem cells). Research on adult stem cells has shown that stem cells may eventually be used to grow heart cells, muscle cells and dopamine-producing cells. See *id.* (explaining embryonic stem cells' potential for replacing diseased cells). Based on this research, adult stem cells could be used in transplanting various organs and bone marrow, developing cells that produce insulin in diabetes patients and growing heart muscle cells to replace damaged cells resulting from a heart attack. See *id.* (discussing medical uses for embryonic stem cells).

135. See *id.* (explaining differences between adult and embryonic stem cells).

136. See *id.* (contrasting adult and embryonic stem cells).

137. See *id.* (explaining preference for using embryonic stem cells in research).

138. See Konsen, *supra* note 1, at 536-37 (contradicting NIH's position that embryonic stem cells are preferable for stem cell research, despite resulting destruction of embryo). Several studies have demonstrated the success researchers have had with adult stem cells. See *id.* (discussing successful research on adult stem cells). Scientists have discovered and isolated adult stem cells from almost all of the areas of the human body. See *id.* (discussing progress made in adult stem cell research). Additionally, research on adult mouse stem cells has shown that those stem cells were able to grow into brain, spinal cord, stomach, liver, intestinal and heart cells. See *id.* (citing Christopher R. R. Bjornson et al., *Turning Brain into Blood: A Hematopoietic Fate Adopted by Adult Neural Stem Cells In Vivo*, 283 *SCI.* 534

members of the scientific community, there is no medical necessity, nor therapeutic benefit to using embryonic stem cells for research.¹³⁹

Legally, opponents of stem cell research rely on the Tennessee Supreme Court's decision in *Davis* as support for their argument that stem cell research should not be allowed.¹⁴⁰ As the reader recalls, the *Davis* court stated that embryos are potential life and, thus, entitled to certain protections.¹⁴¹ In addition, some states have enacted legislation that restricts or prohibits stem cell research.¹⁴²

Current federal statutes that address fetal research would seem to ban embryonic stem cell research as well.¹⁴³ Further, through an amendment to the Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Act of 1999, Congress enacted a ban

(1999)) (discussing stem cell transplantation). Another line of research showed that adult bone marrow stem cells successfully generated brain cells. *See id.* (citing Gene C. Kopen et al., *Marrow Stromal Cells Migrate Throughout Forebrain and Cerebellum, and They Differentiate into Astrocytes After Injection into Neonatal Mouse Brains*, 96 PROC. NAT'L ACAD. SCI. U.S.A. 10711 (1999)) (discussing use of adult stem cells to create brain cells). Further research showed that adult blood stem cells were capable of producing adult muscle cells and, conversely, that adult muscle stem cells could produce adult blood cells. *See id.* (citing Emanuela Gussoni et al., *Dystrophin Expression in the MDX Mouse Restored by Stem Cell Transplantation*, 401 NATURE 390 (1999) (discussing results of studies indicating hematopoietic cells can produce myocytes); Kathyjo Ann Jackson et al., *Hematopoietic Potential of Stem Cells Isolated from Murine Skeletal Muscle*, 96 PROC. NAT'L ACAD. SCI. U.S.A. 14482 (1999) (discussing potential for stem cells obtained from adult muscle tissue to produce blood cells)).

139. *See* Konsen, *supra* note 1, at 535 (arguing that “[embryonic stem cell research] is not necessary in light of recent scientific discoveries concerning stem cells taken from non-embryonic sources”).

140. *See* *Davis v. Davis*, 842 S.W.2d 588, 597 (Tenn. 1992) (finding that embryos are potential life and deserve special protection due to that status); Konsen, *supra* note 1, at 530 (explaining courts' variations in decisions about embryos' potential personhood). For a further discussion of courts' varying views on embryos' personhood, see *supra* notes 19-68 and accompanying text.

141. *See* *Davis*, 842 S.W.2d at 588 (stating embryos were entitled to “special respect because of their potential for human life”). It should be noted that the *Davis* court abstained from specifying precisely what protections should be afforded to embryos. For a discussion of *Davis*, see *supra* notes 22-28 and accompanying text.

142. *See* LA. REV. STAT. ANN. § 9:122 (West 2003) (“No in vitro fertilized human ovum will be farmed or cultured solely for research purposes. . . .”); *id.* § 9:126 (suggesting in vitro embryo has rights); MINN. STAT. § 145.422 (West 2002) (setting penalty for “laboratory research or other experimentation except to protect the life or health of the conceptus” as gross misdemeanor); S.D. CODIFIED LAWS § 34-14-16 (Michie 2003) (“No person may knowingly conduct nontherapeutic research that destroys a human embryo.”); *id.* § 34-14-17 (“No person may knowingly conduct nontherapeutic research that subjects a human embryo to substantial risk of injury or death.”).

143. *See* Public Health Service Act, 42 U.S.C. § 289g (1993) (prohibiting research on nonviable human fetuses outside uterus unless research “may enhance the well-being or meet the health needs of the fetus or enhance the probability of its survival to viability”). For the relevant text of the Public Health Service Act, see *supra* note 87.

on federal funding of any type of research involving the destruction of embryos.¹⁴⁴ Advocates against stem cell research contend that this ban on embryo research implies that embryos are to be afforded certain legal protections—the same legal protections to which fetuses are entitled.¹⁴⁵

V. RECOMMENDATIONS FOR FEDERAL LEGISLATION REGULATING AND FUNDING STEM CELL RESEARCH AND PROPOSAL OF MODEL LEGISLATION

Despite arguments made to the contrary, embryonic stem cell research appears to be growing in frequency and popularity.¹⁴⁶ Many view this trend as a necessary and important step to be taken in the area of medicine.¹⁴⁷ Based on the view that most courts have taken, treating embryos as property and not as persons, embryonic stem cell research should not present any legal obstacles in terms of embryo rights.¹⁴⁸ Federal law

144. See Consolidated Appropriations Act of 2001, Pub. L. No. 106-554, § 510(a)(1), 114 Stat. 2763 (2000) (prohibiting providing federal funds for research on embryos). For the relevant text of the Consolidated Appropriations Act, see *supra* note 87; see also Konsen, *supra* note 1, at 512 (describing Consolidated Appropriations Act).

145. See Konsen, *supra* note 1, at 512 (“The current embryonic research ban extends to embryos the protection given to fetuses in the *United States Code* and in the *Code of Federal Regulations*.”). The restrictions on fetal research also include the requirement that the research must “seek to meet the health needs of the fetus while minimizing risk, and always ensuring that the experiments pursue important biomedical knowledge that cannot be obtained by other means.” *Id.* at 513. By including the same language and risk requirements in the current embryonic research ban, the federal government intended to protect embryos under the law in the same way that it protects fetuses. See *id.* (arguing embryonic research ban entitles embryos to same status and protections as fetuses).

146. See Goldstein, *supra* note 102, at 256 (“With or without the support of the federal government, pluripotent stem cell research will continue.”).

147. See *id.* (explaining growing trend of embryonic stem cell research). If the federal government does not regulate and fund embryonic stem cell research, private companies and laboratories who already do the research will not be deterred, and will continue their research. See *id.* (explaining need for federal regulation of stem cell research). By refusing to fund embryonic stem cell research, the federal government will in effect be refusing the chance to closely monitor stem cell research and its results. See *id.* (explaining need for federal funding and regulation). For a more detailed discussion of the concerns over the government’s failure to regulate stem cell research, see *supra* notes 122-26 and accompanying text.

148. See *Roe v. Wade*, 410 U.S. 113, 158 (1973) (stating that unborn are not persons in eyes of Constitution); *York v. Jones*, 717 F. Supp. 421, 425 (E.D. Va. 1989) (finding that frozen embryos were property subject to bailor-bailee relationship); *Cahill v. Cahill*, 757 So. 2d 465 (Ala. Civ. App. 2000) (treating frozen embryos as property subject to property settlement at time of divorce); *A.Z. v. B.Z.*, 725 N.E.2d 1051, 1059 (Mass. 2000) (emphasizing rights of parents to decide whether to implant embryos and become parents); *J.B. v. M.B.*, 783 A.2d 707, 719 (N.J. 2001) (treating embryos as property); *Kass v. Kass*, 696 N.E.2d 174, 179 (N.Y. 1998) (concluding embryos are not persons for purposes of whether they have constitutional rights).

should encourage and fund embryonic stem cell research because of the many benefits that scientific research on embryos provides.¹⁴⁹

Banning federal funding for the derivation of new embryonic stem cell lines, but continuing to provide it for stem cell lines already in existence, inadequately fosters medicinal research.¹⁵⁰ Rather, legislation should be drafted to fund embryonic stem cell research on new cell lines, subject to specific regulations and restrictions.¹⁵¹ Congress should model the legislation after several examples: the New Hampshire statute that addresses embryo research, a proposed bill in Pennsylvania that addresses embryo research and Great Britain's policy on stem cell research.¹⁵² Additionally, the legislation should reflect the view that embryos are property, a

149. See Enmon, *supra* note 44, at 647 (arguing for federal policy providing funding for embryonic stem cell research). Without funding from the federal government, research will likely not be as productive as it would with the government's approval. See *id.* (discussing benefits of policy permitting federal funding of stem cell research). Without federal funding, it is possible that more stem cell lines will not be created, thereby hindering progress made by stem cell research. See *id.* (discussing concerns over current funding ban).

Further, a policy providing federal funding for embryonic stem cell research would eliminate the government's need to rely on private companies and foreign medical research to provide the stem cell lines necessary for the research. See *id.* (explaining advantages of federal funding of stem cell research). Because the stem cell lines that do exist were derived by private companies or researchers in foreign countries, there is a possibility that the federal government's researchers will not have full access to all of the stem cell lines, again slowing down the progress of the research. See *id.* (explaining need for federal funding to remain competitive in medical research). All of these concerns warrant federal funding and legislation in the area of embryonic stem cell research. See *id.* at 547-48 (outlining reasons for federal funding and legislation).

150. See *Bush Remarks*, *supra* note 73 (explaining compromise on federal funding for embryonic stem cell research); see also Enmon, *supra* note 44, at 647 (explaining that "a policy funding the establishment of embryonic stem cell lines from excess IVF embryos may have been the wiser choice" than compromise presented by President Bush). Moreover, because embryonic stem cell research continues to provide many hopes for possible treatments for life-threatening diseases, the government's position prevents those benefits from reaching individuals who need them. See *id.* (discussing need for access to stem cell therapy).

Nevertheless, President Bush's compromise did not completely preclude funding for all embryonic stem cell research. See Enmon, *supra* note 44, at 647 ("Although President Bush's policy is far from revolutionary, it has at least unlocked the door to medical research previously denied funding."). By announcing that the government would continue to support stem cell research using pre-existing embryonic stem cell lines, President Bush did not completely eradicate funding for all embryonic stem cell research. See *id.* (explaining compromise permitting funding for limited research). In this way, he at least allowed a portion of the research to continue, although not as freely as the medical community would have preferred. See *id.* (discussing shortcomings of current compromise).

151. See Enmon, *supra* note 44, at 647 (arguing in favor of extending federal funding to create new embryonic stem cell lines).

152. See *id.* (arguing for funding of stem cell research based on more permissive policy).

view consistent with that taken by a majority of U.S. state and federal courts.¹⁵³

Among the states that have addressed the issue of embryo research, New Hampshire's statute is the best model for federal legislation because it encourages embryonic stem cell research.¹⁵⁴ The fourteen-day post-fertilization age limit that the statute imposes is a reasonable restriction that Congress should include in federal legislation.¹⁵⁵ Moreover, the statute contains an assumption of informed consent by the donor.¹⁵⁶ Thus, the New Hampshire statute is a good model for federal legislation because it permits research subject to certain important restrictions—namely, that the embryos used may not be over fourteen days post-fertilization and that the embryos must be donated specifically for research purposes.¹⁵⁷

Another guide in developing federal legislation for funding and regulation of embryonic stem cell research is a proposed bill pending in the Pennsylvania state legislature.¹⁵⁸ Like the New Hampshire statute, the proposed Stem Cell Research Authorization Act purports to permit embryonic stem cell research under certain circumstances.¹⁵⁹ The bill expands

153. See generally N.H. REV. STAT. ANN. § 168-B:15(I) (2002) (providing restrictions on embryo research); Fertilisation Regulations, *supra* note 113 (defining embryo research and how it may be performed); *Roe*, 410 U.S. at 157 (concluding that U.S. Constitution does not recognize unborn as persons); *York*, 717 F. Supp. at 425 (holding that embryos are property and are to be treated as such for purposes of divorce); *Kass*, 696 N.E.2d at 174 (holding that contract law principles are to be applied in disposition of excess frozen embryos in event of divorce); Stem Cell Research Authorization Act, *supra* note 83, §§ 2-7 (proposing guidelines permitting embryonic stem cell derivation and research).

154. See N.H. REV. STAT. ANN. § 168-B:15(I) (2002) (addressing embryo research). For the relevant text of the statute, see *supra* text accompanying note 78. The statute does not address the issue of whether stem cell research is permitted in the state; rather, it implies that embryonic stem cell research is permitted on embryos donated for research that are under fourteen days post-fertilization. See *id.* (implying that embryo research is permitted); see also *supra* notes 77-80 and accompanying text.

155. See *Stem Cell Information*, *supra* note 10 (explaining best age of embryos for removal of stem cells for research is four to five days post-fertilization); see also Young, *supra* note 94, at 849 (explaining that Great Britain's stem cell research policy permits research and stem cell derivation from embryos up to fourteen days post-fertilization).

156. See N.H. REV. STAT. ANN. § 168-B:15 (II) (2002) ("No preembryo that has been donated for research shall be transferred to a uterine cavity."). This subsection implies that embryos used for research must be donated for that specific purpose and are not to be used for any other purposes, such as implantation into a uterus. See *id.* (permitting embryos to be used for research if they have been donated specifically for such purpose).

157. See *id.* (providing restrictions on using embryos for research).

158. See Stem Cell Research Authorization Act, *supra* note 83, §§ 4-6 (proposing legislation permitting embryonic stem cell derivation and research).

159. See *id.* §§ 3-4 (providing conditions under which research may take place). The sections provide, in relevant part:

Section 3. Human embryonic stem cell generation and research.

Scientists engaged in the use of previously derived embryonic stem cells shall not be considered to have destroyed human embryos.

the New Hampshire statute in two important respects. First, the bill specifically defines the term “embryo” and the phrase “embryonic stem cell.”¹⁶⁰ Second, the bill requires that researchers only use embryos donated by fertility clinics, accompanied by a determination signed by the progenitors that the embryos would not be implanted in a uterus to become a human fetus and would otherwise be discarded if they were not donated to research.¹⁶¹

Great Britain’s policy on stem cell research provides a more permissive model than any currently existing or proposed legislation in the United States.¹⁶² Two documents—the Human Embryology and Fertilisation Act of 1990 and The Human Fertilisation and Embryology (Research Purposes) Regulations—embody the policy.¹⁶³ Similar to the New Hamp-

Section 4. Sources of embryonic stem cells

(a) General rule.—For purposes of carrying out research under section 3, the human embryonic stem cells involved shall be derived only from embryos that have been donated from public or private fertility clinics after compliance with all of the requirements of this section.

(b) Written determination.—A written determination signed by the progenitors that the embryo will never be implanted in utero and would otherwise be discarded is required. The written determination can only occur prior to consideration of embryo donation and after consultation with an independent party by the progenitors, if both are known and available or by the female progenitor, if only one of the progenitors is known. Reasonable efforts must be made to contact the progenitors.

(c) Written consent.—After the determination under subsection (b), the written consent of the progenitors, if both are known, or the written consent of the female progenitor, if only one is known, must be obtained for embryo donation. If reasonable efforts to locate the progenitors fail, approval for embryo donation is presumed.

Id.

160. *See id.* § 2 (providing definitions of key terms). The term “embryo” and the phrase “embryonic stem cell” are defined by section 2 of the Act as follows:

“Embryo.” An individual organism of the species *Homo sapiens* that is comprised of an oocyte which has been fertilized through the introduction of sperm and which has at present the capacity to develop in utero into a human fetus. The term shall include organisms that are fertilized *ex vivo* and *in vivo*. Organisms with morphological similarity to an embryo but which were not created with germ line cells from two human progenitors shall not be considered to be an embryo. This definition shall only apply to embryos existing outside the uterus.

“Embryonic stem cell.” A cell that originates from the inner cell mass of a human embryo and has the potential to develop into all or nearly all of the tissues in a human body, the potential known as pluripotentiality.

Id.

161. *See id.* § 4 (discussing sources of embryonic stem cells and circumstances under which embryonic stem cells may be obtained). For the full text of section 4, see *supra* note 159.

162. *See generally* Fertilisation Regulations, *supra* note 113 (defining embryo research and how it may be performed).

163. *See* Young, *supra* note 94, at 848 (explaining that Britain’s policy is contained in Fertilisation Act and Fertilisation Regulations). Britain’s policy on stem cell research is considerably more permissive than that of the United States. *See id.* (outlining British policy). While the policy itself permits more research than the

shire statute and the proposed Stem Cell Research Authorization Act, the British policy emphasizes restrictions such as the fourteen-day post-fertilization age limit for the embryos and a strict informed consent requirement.¹⁶⁴ Most importantly, unlike any of the U.S. legislation, the British regulations expressly permit embryonic stem cell research.¹⁶⁵

In addition to the above-mentioned principles, Congress should incorporate the courts' views of embryos as property as justifications for the

United States, the British government has kept a closer eye on the stem cell research processes than the United States. *See id.* at 852-53 (contrasting American and British embryonic stem cell research policies). Among the British policy's requirements, the Act provides that scientists wishing to conduct embryonic stem cell research must apply for a license from the British government and submit all research proposals to a government-appointed peer group for review and approval before that research can take place. *See id.* at 849 (detailing British policy regulations). Additionally, the government has published a code of practice by which scientists must abide when doing their research in order to retain their licenses. *See Ayer, supra* note 102, at 407 (outlining requirements of British stem cell research policy).

164. *See Young, supra* note 94, at 849 (citing Fertilisation Act for proposition that embryos may not be used for research past age of fourteen days post-fertilization or until primitive streak appears, whichever occurs first). The Act also provides that embryos may not be cryopreserved for more than five years unless specified differently in the license. *See id.* (explaining provisions in Fertilisation Act).

Regarding informed consent, the Act has very stringent requirements. *See id.* at 849-50 (discussing informed consent requirements); *see also Ayer, supra* note 102, 408-09 (discussing informed consent requirements). The text of the Act provides that donor informed consent is valid only if the following requirements have been met:

- (a) [The donor] must be given a suitable opportunity to receive proper counseling about the implications of taking the proposed steps, and
- (b) [The donor] must be provided with such relevant information as is proper.

Id.

There is still some dispute among clinics in Britain over the meaning of "relevant information," but the informed consent requirement is clearly present in some form in the Fertilisation Act. *See Ayer, supra* note 102, at 408-09 (discussing components of informed consent requirement); *Young, supra* note 94, at 850 (explaining varying detail of information required).

165. *See Fertilisation Regulations, supra* note 113 (providing embryonic stem cell research may be performed for certain specific purposes). The Regulations provide three purposes for which embryonic stem cell research is permitted:

- (a) increasing knowledge about the development of embryos;
- (b) increasing knowledge about serious disease; or
- (c) enabling any such knowledge to be applied in developing treatments for serious disease.

Id.

The Regulations were enacted specifically for the purpose of broadening the allowable reasons for embryonic stem cell research. *See Young, supra* note 94, at 848-49 (explaining purpose of Regulations). Because they focus on increasing knowledge about serious disease and treatment of serious disease, the Regulations are applicable to stem cell research and take a very permissive view of the research. *See id.* at 849 (explaining application of Regulations to embryonic stem cell research).

legislation.¹⁶⁶ Only one court, the Tennessee Supreme Court, has ever specifically found that embryos represent “potential for life” and, as such, are entitled to “special respect.”¹⁶⁷ Even that court, however, declined to call embryos “persons” or to declare that embryos were entitled to certain legal rights that protected them from harm.¹⁶⁸ The majority of the state and federal courts that have examined the issue of how to treat embryos take the view that embryos are property or, alternatively, are not “persons” for constitutional purposes.¹⁶⁹ The courts’ willingness to use contract law to govern disputes over the disposition of embryos in divorce situations bolsters this position.¹⁷⁰

VI. CONCLUSION

The U.S. government should provide funding for embryonic stem cell research for several reasons. Most importantly, the government should fund embryonic stem cell research in order to remain competitive in the field of medicine and disease treatment.¹⁷¹ Allowing this research to be regulated at a state level does not accomplish this goal because state policies on embryonic stem cell research differ drastically from state to state.¹⁷² Regulation on a national level will ensure consistency among the states and better enable the United States to compete globally in the race for medical breakthroughs that may derive from embryonic stem cell re-

166. See *Roe v. Wade*, 410 U.S. 113, 157 (1973) (concluding that Constitution does not recognize unborn as persons); *York v. Jones*, 717 F. Supp. 421, 425 (E.D. Va. 1989) (holding that embryos are property and are to be treated as such for purposes of divorce).

167. See *Davis v. Davis*, 842 S.W.2d 588, 597 (Tenn. 1992) (“We conclude that [embryos] 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 *Davis* court also acknowledged the possibility that an embryo “may never realize its biologic potential.” *Id.* at 596.

168. See *id.* at 597 (acknowledging that embryos deserve “special protection,” but declining to explain specific examples or meaning of “special protection”).

169. See *Roe*, 410 U.S. at 156 (finding that Constitution does not intend for unborn to be included in definition of person); *York*, 717 F. Supp. at 425 (treating embryos as property); *Cahill v. Cahill*, 757 So. 2d 465, 467 (Ala. Civ. App. 2000) (advocating contractual approach to resolving embryo dispute in event of divorce).

170. See *Cahill*, 757 So. 2d at 467 (treating embryos as property by framing issue as which party had, by contract, created property interest in embryos); *Kass v. Kass*, 696 N.E.2d 174, 176 (N.Y. 1998) (implying embryos are property by applying contract law to disposition of frozen embryos during divorce proceedings, in same way as applies to property settlements). For a further discussion of *Kass*, see *supra* notes 29-36 and accompanying text. For a further discussion of *Cahill*, see *supra* notes 40-44 and accompanying text.

171. For a discussion of the argument that refusing to provide federal funding for stem cell research will severely undermine the ability of the United States to compete in the field of medical research, see *supra* notes 112-16 and accompanying text.

172. For examples of differing state legislation on embryo research, see *supra* notes 69-85 and accompanying text.

search.¹⁷³ In light of the above, Congress should replace the current ban on funding for embryonic stem cell research with a more permissive policy.¹⁷⁴

VII. POSTSCRIPT

Since the writing of this Note, two states have taken significant steps toward the advancement of stem cell research.¹⁷⁵ In February 2004, the governor of New Jersey included in his state budget plan an allocation of \$6.5 million to build a research institute dedicated to stem cell research.¹⁷⁶ This is part of a plan that includes the allocation of state funds of \$50 million over the next five years for stem cell research.¹⁷⁷ By adding this to the state budget plan, New Jersey's governor has made New Jersey the first state in the United States to provide funding for stem cell research.¹⁷⁸ California is also currently exploring the issue of providing state funding for stem cell research through a proposed ballot initiative that would raise \$3 billion over the next ten years specifically to fund stem cell research.¹⁷⁹ These states' recognition of the importance of providing funding for stem cell research provides more support for the call to Congress to make this funding available on the federal level.

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173. For a discussion of the relationship between federal funding and federal regulation of stem cell research, see *supra* notes 122-24 and accompanying text.

174. For a discussion of the arguments for repealing the current congressional ban and permitting federal funding for embryonic stem cell research, see *supra* notes 102-26. For recommendations for a more permissive embryonic stem cell research policy, see *supra* notes 152-66 and accompanying text.

175. See Laura Mansnerus, *New Jersey Governor Puts Stem Cell Research in Budget Plan*, N.Y. TIMES, Feb. 21, 2004, at B1, available at <http://www.nytimes.com/2004/02/21/nyregion/21jersey.html> (discussing New Jersey and California state funding plans for stem cell research).

176. See *id.* (explaining governor's plan to include state funding in budget for stem cell research institute).

177. See *id.* (explaining that governor plans to spend \$50 million over five years for stem cell research).

178. See *id.* (noting that advisers to governor found in their research that no other state funds stem cell research).

179. See *id.* (explaining California's ballot initiative).

