

Fall 2002

Stem Cells and the States: Promulgating Constitutional Bans on Embryonic Experimentation

Mailee R. Harris

Follow this and additional works at: <https://scholar.valpo.edu/vulr>

Recommended Citation

Mailee R. Harris, *Stem Cells and the States: Promulgating Constitutional Bans on Embryonic Experimentation*, 37 Val. U. L. Rev. 243 (2002).

Available at: <https://scholar.valpo.edu/vulr/vol37/iss1/4>

This Notes is brought to you for free and open access by the Valparaiso University Law School at ValpoScholar. It has been accepted for inclusion in Valparaiso University Law Review by an authorized administrator of ValpoScholar. For more information, please contact a ValpoScholar staff member at scholar@valpo.edu.



STEM CELLS AND THE STATES: PROMULGATING CONSTITUTIONAL BANS ON EMBRYONIC EXPERIMENTATION

*By general law, life and limb must be protected,
yet often a limb must be amputated to save a life;
but a life is never wisely given to save a limb.¹*

I. INTRODUCTION

It is hardly disputed that the “summer potboiler” lawmakers faced in 2001 involved the destiny of thousands of tiny embryos stored in fertility clinics across the nation.² Other than the issue of war, President George W. Bush himself perceived the stem cell decision as “the biggest of his presidency in terms of long-term impact.”³

While fetal experimentation and other forms of research on unborn children have been on the forefront of scientific debate for years, the issue of stem cell research did not surface until the late 1990s.⁴ Yet, the groundwork for stem cell research initially began with the introduction of in vitro fertilization (“IVF”) technology in the 1970s.⁵ Not only a tool used to research live human embryos, IVF continues to attract a growing number of infertile couples that cannot naturally conceive their own children.⁶ Through the IVF process, mature eggs are obtained from the woman and fertilized in a lab.⁷ After fertilization, the newly created embryos are placed into the woman’s uterus.⁸

Because not all of the embryos will successfully implant on the uterine wall, many embryos are created and several are injected into the uterus.⁹ Thus, between the IVF process itself and the use of fertility

¹ Letter from Abraham Lincoln to A.G. Hodges (Apr. 4, 1864), in 2,000 CLASSIC LEGAL QUOTATIONS 358 (M. Frances McNamara ed., 1992).

² Terence Samuel, *Matters of Life and Death*, U.S. NEWS & WORLD REP., July 30, 2001, at 14.

³ *Id.* at 17.

⁴ Susan Lee, *Human Stem Cell Research: NIH Releases Draft Guidelines for Comment*, 28 J.L. MED. & ETHICS 81, 81-82 (2000).

⁵ Ronald M. Green, *Stopping Embryo Research*, 9 HEALTH MATRIX 235, 237 (1999).

⁶ *Id.*; Samuel B. Casey, *How the Law Will Shape Life and Death Decisions: The Case of the Human Embryo*, BIO ENGAGEMENT 150 (Nigel M. de S. Cameron et al. eds., 2000).

⁷ Casey, *supra* note 6, at 151 n.8.

⁸ *Id.*

⁹ See generally Green, *supra* note 5, at 241 (stating that “up to two-thirds of all fertilized eggs do not implant”).

244 VALPARAISO UNIVERSITY LAW REVIEW [Vol. 37]

drugs given to women at fertility clinics, IVF programs generally create more embryos than the number of children the couple actually desires.¹⁰ Those embryos not immediately injected into the woman are frozen alive through a process called cryopreservation.¹¹ These “spare embryos” can then be used for implantation at a later time.¹² The IVF clinics generally store these frozen embryos for a fixed number of years, after which the parents must make a decision: either pay an annual fee to continue the storage, implant the remaining embryos, destroy the embryos, or donate the embryos for some purpose.¹³ These spare embryos, created with the purpose of growing into children and adults, are the central focus of the stem cell research debate.

In 1999, an estimated 150,000 living embryos were stored in the nation’s IVF clinics.¹⁴ Frozen in liquid nitrogen tanks through cryopreservation, at least 19,000 embryos are added to their ranks each year.¹⁵ The conservative estimate for the number of frozen embryos in

¹⁰ Casey, *supra* note 6, at 151.

¹¹ *Id.* Cryopreservation is the “storage of living tissue in extreme cold.” Michael Cannell, *Ice Age at the Zoo*, THE WASH. POST, Oct. 10, 1999, at A1. In cryopreservation, embryos are immersed in a liquid consisting of sucrose, or common table sugar, and propanediol. Sally Squires, *Pre-embryos in a Frozen Tank*, THE WASH. POST, Apr. 12, 1988, at Z16. This substance protects the embryos when they are frozen. *Id.* The embryos are then vacuum sealed in a tank by liquid nitrogen, frozen at a temperature of minus 196 degrees centigrade. *Id.* The tanks that store the frozen embryos are refilled daily. *Id.* Experiments with cryopreservation began in the late 1940s, and the process has been used for the last fifteen years as a reproductive technique in cattle breeding. Judy Licht, *Frozen in Time; Storing of Embryos Boosts the Chances of Pregnancy—And Raises Ethical Questions*, THE WASH. POST, Nov. 26, 1991, at Z10.

¹² *Opportunities and Advancements in Stem Cell Research: Hearing Before the House Subcomm. on Criminal Justice, Drug Policy, and Human Resources*, 107th Cong. 74-75 (2001) [hereinafter Davidson] (statement of JoAnn Davidson, Program Director for the Snowflakes Embryo Adoption Program); Harold E. Varmus, M.D., *The Challenge of Making Law on the Shifting Terrain of Science*, 28 J.L. MED. & ETHICS 46, 49 (2000).

¹³ Davidson, *supra* note 12, at 75. Examples of such donations include research purposes, such as stem cell research, and embryonic adoption. *Id.*; see also Rita Rubin, *100,000 Frozen Embryos: One Couple’s Surplus can Fill Void of Another*, U.S.A. TODAY, Dec. 8, 1988, at 1A (outlining the growing practice of donating embryos to infertile couples or single women for adoption); *Text of President Bush’s Speech*, THE WASH. POST, Aug. 10, 2001, at A12 (stating that parents should be allowed to donate their embryos to science).

¹⁴ Lori B. Andrews, *Embryonic Confusion: When You Think Conception, You Don’t Think Product Liability. Think Again.*, THE WASH. POST, May 2, 1999, at B1; see also Davidson, *supra* note 12, at 75; Casey, *supra* note 6, at 152.

¹⁵ Andrews, *supra* note 14, at B1.

2001 was 188,000.¹⁶ The question facing parents, researchers, and lawmakers—indeed, the entire nation—is, *what do we do with them now?*

The scientific community and many lawmakers are urging the use of the embryos for embryonic stem cell research, as stem cells are thought to hold the key for treating or curing many degenerative conditions.¹⁷ Embryonic stem cells, the building block cells that eventually develop into specialized cells and tissues, were first isolated and cultured by two research teams in 1998.¹⁸ Stem cells are derived from embryos in the blastocyst stage of development.¹⁹ During this blastocyst stage, when the inner cell mass of the embryo contains 200 to 300 cells, the cells divide and begin to form a hollow ball.²⁰ The shell surrounding the inner mass is destroyed and the cells are removed.²¹ These cells continue to grow in petri dishes and can be coaxed into differentiating or developing into various cell types.²²

The process of removing the inner cell mass, or stem cells, is performed only on living human embryos.²³ The embryos are

¹⁶ Davidson, *supra* note 12, at 78.

¹⁷ Kevin P. Quinn, *Embryonic Stem Cell Research as an Ethical Issue: On the Emptiness of Symbolic Value*, 13 ST. THOMAS L. REV. 851, 851 (2001). Such conditions include Parkinson's disease, Alzheimer's disease, diabetes, and spinal cord injuries. *Id.* Many scientists believe that advances through stem cell research will include repairing and replacing damaged organs. Sheryl Gay Stolberg, *Stem Cell Debate in House Has Two Faces, Both Young*, N.Y. TIMES, July 18, 2001, at A1. However, the long-term consequences of treatments from stem cells are unknown. Gretchen Vogel, *Can Adult Stem Cells Suffice?*, 292 SCI. 1820, 1822 (June 8, 2001) [hereinafter Vogel I]. Experiment results in animal studies are rarely observed for longer than one year. *Id.*

¹⁸ Lee, *supra* note 4, at 81; Quinn, *supra* note 17, at 851; Stolberg, *supra* note 17, at A1; see also Laurie McGinley, *Influenced GOP Sen. Frist Supports Stem-Cell Research*, THE WALL ST. J., July 18, 2001, at A20 (terming embryonic stem cells as "primitive building-block cells").

¹⁹ Quinn, *supra* note 17, at 852. Such embryos are usually "in the first two weeks of development, before or just up to the early processes of cellular differentiation, tissue formation, and the appearance of rudimentary bodily form." Green, *supra* note 5, at 236-37. Another source indicates that stem cells are extracted from five-day-old embryos. Rachel K. Sobel, *From Tiny Cells Comes Uncertain Silence*, U.S. NEWS & WORLD REP., July 30, 2001, at 17.

²⁰ THE HUMAN EMBRYONIC STEM CELL DEBATE xvii (Suzanne Holland et al. eds., 2001); Varmus, *supra* note 12, at 48; Stolberg, *supra* note 17, at A1. Other sources indicate that the embryos contain as few as 100 cells. Jose B. Cibelli et al., *The First Human Cloned Embryo*, SCI. AM., Jan. 2002, at 45.

²¹ THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at xvii; Varmus, *supra* note 12, at 48. If allowed to develop, the outer shell would become the placenta. THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at xvii.

²² Quinn, *supra* note 17, at 852; Varmus, *supra* note 12, at 48.

²³ THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at xviii.

inescapably destroyed.²⁴ Those opposing the destruction of embryonic life include pro-life advocates, congressmen, ethicists, and even some geneticists and scientists.²⁵ Several states, asserting their interest in the protection of human life, have reacted to the rise in experimentation by banning all embryonic research within their borders.²⁶ Such bans, however, do not always stand the test of the United States court system, and the Supreme Court has provided no guidance in promulgating constitutional laws.²⁷

This Note will address the issues surrounding the constitutionality of state bans on experimentation and will propose model statutes for those states desiring to continue protecting their interest in human life. First, this Note will discuss the background of the stem cell research debate.²⁸ Second, this Note will analyze current state bans on embryonic experimentation.²⁹ Third, this Note will set forth what actions should be

²⁴ *Id.*; Quinn, *supra* note 17, at 852.

²⁵ See Samuel, *supra* note 2, at 16-17. See generally *Opportunities and Advancements in Stem Cell Research: Hearing Before the House Subcomm. on Criminal Justice, Drug Policy, and Human Resources*, 107th Cong. 178 (2001) (statement of Christopher Hook, M.D., Senior Fellow of the Center for Bioethics and Human Dignity); *Opportunities and Advancements in Stem Cell Research: Hearing Before the House Subcomm. on Criminal Justice, Drug Policy, and Human Resources*, 107th Cong. 111 (2001) [hereinafter Prentice] (statement of Dr. David A. Prentice, Ph.D., Adjunct Professor of Medical and Molecular Genetics, Indiana University School of Medicine); The Center for Bioethics and Human Dignity, *On Human Embryos and Stem Cell Research: An Appeal for Legally and Ethically Responsible Science and Public Policy*, available at <http://www.cbhd.org/resources/aps/statement/htm> (last visited Aug. 24, 2002) [hereinafter CBHD]. The organization "Do No Harm" is a national coalition of researchers, health care professionals, bioethicists, and legal professionals united in advancing the development of medical treatments and therapies that do not require the destruction of human life. Do No Harm: The Coalition of Americans for Research Ethics (Jan. 2001), available at <http://www.stemcellresearch.org/info/escproblems.htm> (last visited Sept. 28, 2002). The coalition also works to educate the public and public policymakers about promising areas of medical research that do not involve the destruction of human embryos. *Id.* The coalition's name is taken from the Hippocratic Oath, which states, "As to diseases, make a habit of two things—to help, or at least do no harm." *Id.*, available at <http://www.stemcellresearch.org> (last visited Dec. 16, 2002).

²⁶ See *infra* Part III.B.1.

²⁷ See Andrews, *supra* note 14, at B1 ("[N]owhere is the lack of precedents more complicated than in dealing with frozen embryos."); see also Sharon M. Parker, Comment, *Bringing the "Gospel of Life" to American Jurisprudence: A Religious, Ethical, and Philosophical Critique of Federal Funding for Embryonic Stem Cell Research*, 17 J. CONTEMP. HEALTH L. & POL'Y 771, 772 (2001) ("[T]he Supreme Court's abortion jurisprudence has not been dispositive of the issues surrounding early human life.").

²⁸ See *infra* Part II.

²⁹ See *infra* Part III.

taken in attempting to promulgate a constitutional ban and will propose two model statutes.³⁰

II. SCIENTIFIC AND LEGAL ISSUES SURROUNDING THE STEM CELL DEBATE

Stem cell research is an enormous topic, encompassing a vast array of scientific and legal issues. Thus, it is important to have a general knowledge of several issues before evaluating the constitutionality of state bans on embryonic research. This Part will first provide a general explanation of the science of stem cell research, including recent breakthroughs and possible advances in the treatments of diseases.³¹ Second, this Part will discuss federal law and legislation regarding stem cell research.³² Subsequently, an overview of current Supreme Court jurisprudence on the related issue of abortion and mothers' rights will be provided.³³ Lastly, this Part includes a discussion of the court decisions striking down three state statutes banning embryonic research.³⁴

A. *The Science of Stem Cell Research*

Human stem cells have been found in almost every area of the body and are classified as either pluripotent or totipotent.³⁵ Pluripotent stem cells are the earliest stem cells, and they develop into the cells and tissues of the body.³⁶ These cells can only form a limited number of cell types.³⁷ For example, blood stem cells renew and can develop into more specialized blood cells.³⁸ Totipotent stem cells, however, are not limited

³⁰ See *infra* Part IV.

³¹ See *infra* Part II.A.

³² See *infra* Part II.B.

³³ See *infra* Part II.C.

³⁴ See *infra* Part II.D.

³⁵ Prentice, *supra* note 25, at 112-14; THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at xvii-xviii. Stem cells have been defined as "immature cells that can replicate themselves and give rise to daughter cells." Vogel I, *supra* note 17, at 1820.

³⁶ THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at xvii-xviii; Varmus, *supra* note 12, at 48.

³⁷ *Cloning, 2001: Hearing on Sen. 790 Before a Senate Subcomm. of the Comm. on Appropriations, 107th Cong. 14, 16 (2001)* [hereinafter West] (statement of Michael D. West, Ph.D., President and CEO of Advanced Cell Technology, Inc.). However, some sources indicate that with the right cues, pluripotent cells can give rise to any kind of cell in the body. Vogel I, *supra* note 17, at 1820.

³⁸ Varmus, *supra* note 12, at 48. However, recent advances in stem cell technology have revealed that many pluripotent stem cells can actually develop into other types of stem cells. CBHD, *supra* note 25. For example, pluripotent bone marrow stem cells have been directed into forming fat, cartilage, and bone tissue. *Id.*

and can form any tissue in the body.³⁹ In fact, these cells possess the ability to develop into a complete organism.⁴⁰ Totipotent cells also reproduce infinitely.⁴¹

Stem cells are important to the development of medical science because they possess the ability to self-renew.⁴² For example, when a person donates blood, bone marrow stem cells accelerate production to replace blood cells.⁴³ The implications of such renewal indicate significant potential for regenerative medicine.⁴⁴ Many diseases and conditions debilitate and destroy organs.⁴⁵ Through regenerative medicine, cells and tissues are grown and implanted into people with failing tissues and organs.⁴⁶ Such transplants can restore loss of function, cause malfunctioning cells to function properly, and replace dead cells with new cells.⁴⁷ Because of the self-renewing nature of stem cells, researchers believe that they hold the key to repairing tissues and organs.⁴⁸ Possible future treatments developed from stem cell research include the restoration of central nervous system functioning and the reparation of cardiac tissue damaged during heart attacks.⁴⁹

³⁹ West, *supra* note 37, at 16.

⁴⁰ THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at xvii-xviii. It is argued that human embryonic stem cells, even after removal from embryos, may be capable of redeveloping into mature human persons. Samuel B. Casey & Nathan A. Adams, *Specially Respecting the Living Human Embryo by Adhering to Standard Human Subject Experimentation Rules*, 2 YALE J. HEALTH POL'Y L. & ETHICS 111, 112 (2001) [hereinafter Adams]. Experiments to rule out this possibility have not been conducted, and animal studies suggest it is likely. *Id.* at 120. Mice embryonic stem cells, when implanted into female mice, have given rise to mice born with the genetic makeup of the inserted embryonic stem cells. *Id.* at 120 n.108.

⁴¹ Quinn, *supra* note 17, at 852.

⁴² THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at xvii.

⁴³ Thomas B. Okarma, *Human Embryonic Stem Cells: A Primer on the Technology and Its Medical Applications*, in THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at 4.

⁴⁴ *Id.* at 3.

⁴⁵ *Cloning, 2001: Hearing Before a Senate Subcomm. of the Comm. on Appropriations*, 107th Cong. 23, 25 (2001) [hereinafter Vogelstein] (testimony of Bert Vogelstein, Chairman of the National Research Council and Institute of Medicine Committee on Biological and Biomedical Applications of Stem Cell Research).

⁴⁶ *Id.*

⁴⁷ *The Human Cloning Prohibition Act of 2001 and The Cloning Prohibition Act of 2001: Hearing on H.R. 1644 and H.R. 2172 Before the Subcomm. on Health*, 107th Cong. 49 (2001) [hereinafter Okarma testimony] (statement of Thomas Okarma, President and CEO of Geron Corporation, on behalf of Biotechnology Industry Organization).

⁴⁸ Varmus, *supra* note 12, at 48.

⁴⁹ Okarma, *supra* note 43, at 3.

A distinction must be drawn between adult stem cells and embryonic stem cells.⁵⁰ Adult stem cells are derived post-natally from a number of sources in the human body, including muscle tissue, bone marrow, and fat cells.⁵¹ Stem cells can also be derived from placenta and umbilical cord blood cells.⁵² Transplants using these cord blood cells can act as substitutes for bone marrow transplants.⁵³

Embryonic stem cells, however, are harvested shortly after conception.⁵⁴ Because of their ability to grow into all of the body's tissues, these stem cells are thought to hold more potential for future treatments than adult stem cells.⁵⁵ However, recent contrary evidence may prove that assertion false because many possible treatments from embryonic stem cells remain speculative.⁵⁶ For example, embryonic stem cells have never been successfully used in clinical trials with human

⁵⁰ See generally Prentice, *supra* note 25, at 112-113; *Stem Cells, 2001: Hearings Before a Senate Subcomm. of the Comm. on Appropriations*, 107th Cong. 44, 47 [hereinafter Usala] (statement of Anton-Lewis Usala, M.D., Founder and Chief Scientific Officer of Encelle, Inc.).

⁵¹ Prentice, *supra* note 25, at 112-14.

⁵² *Opportunities and Advancements in Stem Cell Research: Hearing Before the House Subcomm. on Criminal Justice, Drug Policy, and Human Resources*, 107th Cong. 100, 101 (2001) [hereinafter Salley] (statement of Nathan Salley, cord blood transplant recipient); *Text of President Bush's Speech*, *supra* note 13, at A12.

⁵³ Salley, *supra* note 52, at 100-01. It is also claimed that placental cells can differentiate into nerves and blood vessels. Vogel I, *supra* note 17, at 1821.

⁵⁴ Usala, *supra* note 50, at 48 (stating that "the mass of cells that begins the process of specific differentiation occurs very shortly after conception"); James A. Thomson, *Human Embryonic Stem Cells*, in *THE HUMAN EMBRYONIC STEM CELL DEBATE*, *supra* note 20, at 15; see also Thomson et al., *Embryonic Stem Cell Lines Derived from Human Blastocysts*, 282 SCI. 1145, 1145 n.5 (Nov. 6, 1998) (stating that embryos were donated with consent of the parents, and the inner cell masses were isolated and the stem cell lines derived therefrom).

⁵⁵ National Institutes of Health Guidelines for Research Using Human Pluripotent Stem Cells, 65 Fed. Reg. 51,976, 51,976-77 (Aug. 25, 2000); *Text of President Bush's Speech*, *supra* note 13, at A12.

⁵⁶ Prentice, *supra* note 25, at 122; see also Usala, *supra* note 50, at 47 ("There is little data to support, or infer, that embryonic human stem cells have any advantages over adult stem cells in medical research."). Congressman Dave Weldon, the lone medical doctor in the House of Representatives, has stated that embryonic research is entirely hypothetical and points out that the research has not even been applied to animals yet. Larry Witham, *Human Faces Put on the Stem-Cell Issue: Members of Both Parties Back, Oppose Research Funds*, THE WASH. TIMES, July 18, 2001, at A4. Weldon also challenges "anyone who makes the assertion [that embryonic stem cells are better than adult cells] to debate me on the merits." *Id.* One researcher describes stem cell research as "trial-and-error guesswork without a fundamental understanding of what makes the cell tick." Sobel, *supra* note 19, at 16. Scientists acknowledge that embryonic stem cells are "decidedly less predictable" than adult stem cells. Gretchen Vogel, *Stem Cells: New Excitement, Persistent Questions*, 290 SCI. 1672, 1672 (Dec. 1, 2000) [hereinafter Vogel II].

patients and have yielded some disastrous results in animal testing.⁵⁷ These cells are also difficult to control in the laboratory.⁵⁸ The cells face considerable risk of immune rejection along with the possibility that a transplant may actually attack the host.⁵⁹ Indeed, even top embryonic researchers acknowledge that, because of immune rejection, embryonic stem cells alone will not effectively create needed treatments; cloning is necessary to produce the desired medical effects.⁶⁰

⁵⁷ Prentice, *supra* note 25, at 112; *see also* Vogel II, *supra* note 56, at 1674. In an experiment implanting embryonic stem cells into the brains of rats, the embryonic cells actually caused the rats' own neural cells to die. *Id.* On the other hand, adult bone marrow cells have been used to repair rat brain tissue without negative responses. *See* S. Ausim Azizi et al., *Engraftment and Migration of Human Bone Marrow Stromal Cells Implanted in the Brains of Albino Rats—Similarities to Astrocyte Grafts*, 95 PROC. NAT'L ACAD. SCI. U.S. 3908, 3912 (Mar. 1998). In fact, one study announced that adult bone marrow stem cells used to treat mice after induced heart attacks actually repaired the damaged heart muscle. Vogel I, *supra* note 17, at 1821. In another similar study, the bone marrow cells formed new heart tissue, including muscle and blood vessels. *Id.* The rats receiving such treatments had significantly less scar tissue. *Id.* However, when embryonic stem cells are injected into mice, the cells form tumors. CBHD, *supra* note 25. In general, embryonic stem cells have a disturbing ability to form tumors, and scientists do not know how to counteract that tendency. Vogel I, *supra* note 17, at 1821. Thus, embryonic stem cells possess an "extremely unstable state." CBHD, *supra* note 25.

⁵⁸ Prentice, *supra* note 25, at 120-24. It is difficult to even keep these embryonic stem cells alive. Vogel II, *supra* note 56, at 1674. In addition, embryonic stem cells are more difficult and tedious to grow than mice stem cells. *Id.* Reports of pure cell populations derived from embryonic cells are sparse. Vogel I, *supra* note 17, at 1822; *see also* Maya Schuldiner et al., *Effects of Eight Growth Factors on the Differentiation of Cells Derived from Human Embryonic Stem Cells*, 97 PROC. NAT'L ACAD. SCI. U.S. 11307, 11310 (Oct. 10, 2000) (stating that, while embryonic stem cells have the capacity to differentiate, that differentiation is spontaneous and unregulated).

⁵⁹ Prentice, *supra* note 25, at 123. Since embryonic stem cells are not identical to the cells of the patient, the patient's immune system rejects the cells. West, *supra* note 37, at 16. Because the body's immune system perceives these cells as foreign, immune rejection poses a substantial obstacle to embryonic stem cell research. Vogelstein, *supra* note 45, at 25; Varmus, *supra* note 12, at 49; *see also* Schuldiner, *supra* note 58, at 11,307 (stating that embryonic stem cells, when inserted into mice, were shown to form differentiated embryonic tumors). Other sources for regenerative treatments may not face the same obstacle. CBHD, *supra* note 25. For example, fetal bone marrow cells do not produce nearly the degree of immune reaction. *Id.* Fetal bone marrow cells can be used to treat adults, and adult cells can be used to treat fetuses. *Id.* Moreover, such fetal cells can be obtained from spontaneously aborted fetuses. *Id.*

⁶⁰ Okarma testimony, *supra* note 47, at 49. Cloning is "critical and necessary" in order for scientists to achieve their "goals in regenerative medicine." *Id.* Not until such technology is used can scientists "develop specific cells for transplantation without immune rejection." *Id.* Some scientists explain that stem cells virtually have no promise without the use of cloning to prevent rejection by patients' immune systems. Carol Ezzell,

This contrasts sharply with procedures developed from adult stem cell research that have already successfully treated human patients.⁶¹ Such procedures facilitate the treatments of certain cancers and autoimmune diseases, as well as the restoration of sight.⁶² In addition, these cells are currently used in animal tests to treat such diseases as diabetes and Parkinson's disease.⁶³ Adult stem cells also demonstrate pluripotency.⁶⁴ Neural stem cells have been transformed into skeletal cells as well as into all types of neural cells;⁶⁵ placenta cells have been coaxed into nerve and muscle cells;⁶⁶ and dental pulp has been differentiated into tooth structures.⁶⁷ Moreover, adult stem cells face no

Cloning and the Law: Will Therapeutic Cloning End Up Being Against the Law?, SCI. AM., Jan. 2002, at 51.

⁶¹ Prentice, *supra* note 25, at 120-22; Salley, *supra* note 52, at 101. "[A]dult human stem cells to date have demonstrated at least as much efficiency as human embryonic stem cells, and the advantages of using embryonic stem cells is only theoretical at this point in time." Usala, *supra* note 50, at 47. Cord blood transplants are already used in place of bone marrow transplants to treat children with leukemia. Salley, *supra* note 52, at 101. Such cord blood is obtained from umbilical cords shortly after birth. *Opportunities and Advancements in Stem Cell Research: Hearing Before the House Subcomm. on Criminal Justice, Drug Policy, and Human Resources*, 107th Cong. 41, 44 (2001) (statement of Marlene Strege, parent of the first adopted former frozen embryo). For example, Nathan Salley, who was diagnosed with leukemia at age eleven, required a bone marrow transplant. Salley, *supra* note 52, at 100. When an exact match was not available, his physicians suggested transplanting umbilical cord blood instead. *Id.* at 101. The transferred cells successfully built an entirely new bone marrow system in Nathan's body. *Id.*

⁶² Prentice, *supra* note 25, at 121 (citing the treatments of brain tumors, ovarian cancer, and breast cancers, as well as rheumatoid and juvenile arthritis, cartilage and bone diseases, and the regeneration of corneas).

⁶³ *Id.* at 122.

⁶⁴ Dale Woodbury et al., *Adult Rat and Human Bone Marrow Stromal Cells Differentiate into Neurons*, 61 J. NEUROSCI. RES. 364, 368-69 (May 30, 2000) (stating that adult stem cells are in limitless supply and can be transformed into other types of cells). With the help of an enzyme, telomerase, scientists may be able to coax stem cells to grow indefinitely, in a way "immortalizing" adult stem cells. CBHD, *supra* note 25. In addition, with further research, scientists will soon be able to coax adult stem cells into almost any cell or tissue type. Do No Harm: The Coalition of Americans for Research Ethics, *Stem Cell Report: Advances in Alternatives to Embryonic Stem Cell Research*, available at <http://www.stemcellresearch.org/stemcellreport/scr-01fall.htm> (last visited Oct. 16, 2002). Bone marrow stem cells alone may be able to form any other type of cell. Do No Harm: The Coalition of Americans for Research Ethics, *Scientific Problems with Using Embryonic Stem Cells* (Nov. 2001), available at <http://www.stemcellresearch.org/info/escproblems.htm> (last visited Dec. 16, 2002); Vogel I, *supra* note 17, at 1821.

⁶⁵ Rossella Galli et al., *Skeletal Myogenic Potential of Human and Mouse Neural Stem Cells*, 3 NATURE NEUROSCI. 986, 986 (Oct. 2000); Stefano Pagano et al., *Isolation and Characterization of Neural Stem Cells from the Adult Human Olfactory Bulb*, 18 STEM CELLS 295, 299 (June 2000).

⁶⁶ Prentice, *supra* note 25, at 116; see also Vogel I, *supra* note 17, at 1821.

⁶⁷ S. Gronthros et al., *Postnatal Human Dental Pulp Stem Cells (DPSCs) in vitro and in vivo*, 97 PROC. NAT'L ACAD. SCI. U.S. 13,625, at 13,630 (Dec. 5, 2000).

immune rejection risks, nor do they demonstrate a tendency to form tumors.⁶⁸ A British medical journal claims that research on embryonic cells “may soon be eclipsed by the more readily available and less controversial adult stem cells.”⁶⁹

As the science and technology involved in stem cell research grows and improves, ethical issues arise regarding the moral status of the embryo.⁷⁰ In response to the divergent views on the embryo’s status, the federal government is involved in regulating the growing biotech industry.⁷¹

B. *The Federal Ban on Funding*

In the Consolidated Appropriations Act of 2001, Congress passed a partial ban on funding for embryonic research.⁷² Federal funds cannot be used in research that destroys, discards, or knowingly subjects a risk of harm or death to human embryos.⁷³ Under the Act, a “human

⁶⁸ Prentice, *supra* note 25, at 113, 124.

⁶⁹ CBHD, *supra* note 25. Indeed, the list of adult stem cells’ potential uses could go on and on. See Vogel I, *supra* note 17, at 1820-21; Vogel II, *supra* note 56, at 1672, 1674. Bone marrow cells can become astrocytes and glial cells, which are the brain’s supporting cells. Vogel II, *supra* note 56, at 1672. Bone marrow cells might also be useful in treating liver disease. *Id.* at 1674. Cells derived from mouse bone marrow cells have already been coaxed into lung tissue, as well as liver, intestine, and skin cells. Vogel I, *supra* note 17, at 1821. Fat cells derived from liposuction can become cells resembling cartilage, bone, and muscle. *Id.* at 1820. In contrast, embryonic stem cells have had relatively modest results. Vogel II, *supra* note 56, at 1674.

⁷⁰ Francoise Baylis, *Human Embryonic Stem Cell Research: Comments on the NBAC Report*, in *THE HUMAN EMBRYONIC STEM CELL DEBATE*, *supra* note 20, at 51. On the one hand is the view that “the embryo is a mere cluster of cells that has no more moral status than any other collection of human cells.” *Id.* There are few moral implications in using such a collection of human cells. *Id.* at 52. On the other hand is the view that “embryos should be considered in the same moral category as children or adults.” *Id.* As such, it would be totally unethical to destroy embryos. *Id.* The National Bioethics Advisory Commission (NBAC) states that these divergent views are totally irreconcilable. *Id.* at 51-52. Because of the extreme position of these views, there is no middle ground. *Id.*

⁷¹ See *infra* Part II.B.

⁷² Consolidated Appropriations Act of 2001, Pub. L. No. 106-554, § 510(a), 112 Stat. 2763, 2763A-71 (2000) (codified at 45 C.F.R. § 46.208(a)(2) and 42 U.S.C. § 289g(b)).

⁷³ *Id.* The Act applies to both embryonic and fetal stem cell research. *Id.* Federal funds may not be used for the creation of embryos for research purposes. *Id.* Section 510(a) provides:

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 45 C.F.R.

embryo" is any organism derived by fertilization from human gamete or diploid cells.⁷⁴ The Act uses a standard already codified for determining the risk of injury.⁷⁵ First, research can be conducted only when "the risk to the fetus imposed by the research is minimal and the purpose of the activity is the development of important biomedical knowledge which cannot be obtained by other means."⁷⁶ "Minimal risks" occur when "the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests."⁷⁷ In addition, the standard of risk to embryos is the same as that "for fetuses which are intended to be aborted and fetuses which are intended to be carried to term."⁷⁸ These regulations apply to all grants and contracts made by the Department of Health and Human Services.⁷⁹ Thus, federally funded researchers cannot destroy or discard embryos or perform experiments that will impose a greater than minimal risk of harm.⁸⁰

In August 2000, the National Institutes of Health released its *Guidelines for Research Using Human Pluripotent Stem Cells* ("Guidelines").⁸¹ According to the Guidelines, federal funds may be

46.208(a)(2) and section 498(b) of the Public Health Service Act (42 U.S.C. 289g(b)).

Id.

⁷⁴ *Id.* Section 510(b) provides:

For purposes of this section, the term "human embryo or embryos" includes any organism, not protected as a human subject under 45 CFR 46 as of the date of the enactment of this Act, that is derived by fertilization, parthenogenesis, cloning, or any other means of one or more human gametes or human diploid cells.

Id.

⁷⁵ *Id.*

⁷⁶ 45 C.F.R. § 46.208(a)(2) (2000).

⁷⁷ *Id.* § 46.102(i) (2000).

⁷⁸ 42 U.S.C. § 289g(b) (2000).

⁷⁹ 45 C.F.R. § 46.201 (2000).

⁸⁰ See Consolidated Appropriations Act § 510(a).

⁸¹ National Institutes of Health Guidelines for Research Using Human Pluripotent Stem Cells, 65 Fed. Reg. 51,976 (Aug. 25, 2000). The National Institutes of Health ("NIH") highlighted several reasons for its decisions in promulgating the Guidelines. *Id.* The NIH claims that adult stem cells do not have the promise that embryonic stem cells possess, as adult stem cells have not yet been found for all tissue types. *Id.* For example, the agency stated that cardiac stem cells have not yet been identified. *Id.* The NIH also claims that adult stem cells are only present in small quantities and are difficult to isolate. *Id.* Yet another NIH claim is that stem cells derived from adults with genetic disorders will also carry genetic errors. *Id.* Because of advances in adult stem cell research, however, such

used for research on stem cells derived from embryos that are “in excess of clinical need” and created for fertility treatment purposes.⁸² However, funds may not be used in the actual derivation of the stem cells from the embryos.⁸³ Even so, research on stem cells after derivation from embryos is considered ethically acceptable because the cells are no longer embryos.⁸⁴ Thus, federal money may not be used to destroy

claims appear outdated or incorrect. Adams, *supra* note 40, at 116 n.56 (stating that “substantial evidence” contradicts the NIH’s claims); Do No Harm: The Coalition of Americans for Research Ethics, *Adult Stem Cell Shown to have Same Versatility Once Claimed only for Embryonic Stem Cells* (June 20, 2002), available at <http://www.stemcellresearch.org/pr/pr020620.htm> (last visited Dec. 16, 2002). See generally Prentice, *supra* note 25; Usala, *supra* note 50; CBHD, *supra* note 25; *supra* notes 50-69 and accompanying text (discussing adult and embryonic stem cells). Thus, several of the factors upon which the NIH constructed its Guidelines may no longer be adequate to support its reasoning. Do No Harm, *supra*. See generally Prentice, *supra* note 25; Usala, *supra* note 50; CBHD, *supra* note 25.

⁸² National Institutes of Health Guidelines for Research Using Human Pluripotent Stem Cells, 65 Fed. Reg. at 51,979. The NIH neglected to consider one “clinical need,” however. Parents of “spare embryos” now have the option of embryo adoption. See Davidson, *supra* note 12, at 75. Many genetic parents, those who created embryos through the IVF process, are emotionally invested in their embryos, making destruction or donation to research unappealing. *Id.* On the other hand, embryo adoption offers benefits to both the genetic parents and the infertile adopting parents. *Id.* at 75-76. The genetic parents usually pick the adopting parents in an open adoption, which is more psychologically rewarding than closed adoptions. *Id.* at 76. Embryo adoption also includes a thorough home study, which ensures genetic parents that their children are placed in stable family environments. *Id.* In addition, the adopting parents obtain the experiences of pregnancy, prenatal bonding, and childbirth that are not obtained through regular adoptions. *Id.* The home study also ensures that the embryos received are not paternally related, which is a problem with donor facilities. *Id.* Embryonic adoption is also much less expensive than IVF, with the average adoption costing between 7,000 and 10,000 dollars. *Id.* IVF, however, generally costs over 50,000 dollars. *Id.* One agency, the Snowflake Embryo Adoption Agency, has doubled its embryonic adoption every year since its start and has increased its embryo adoptions by over 600%. *Id.* at 78. The “clinical need” for these embryos is obvious. See *id.* In 1999, the conservative estimate of frozen embryos was 188,000. *Id.* Approximately 50% of the frozen embryos die during the thawing process. *Id.* In addition, for women under thirty-five years of age, the national birth rate for IVF is 37.2%. *Id.* For women over forty years of age, the birth rate sinks to 13.4%. *Id.* Thus, approximately 12,600 to 35,000 children could be born from these 188,000 embryos. *Id.* With infertility affecting 6.5 to 10 million couples in the United States alone, the “clinical need” for these embryos is staggering. *Id.* This need also negates the common argument, which is echoed throughout Congress and the media, that the frozen embryos “will just be destroyed, anyway,” if not used for research. C. Ben Mitchell, *NIH, Stem Cells, and Moral Guilt* (Aug. 24, 2000), available at <http://www.cbhd.org/resources> (last visited Dec. 16, 2002); see also Rubin, *supra* note 13, at 2A (stating that the demand for embryos greatly outstrips the supply).

⁸³ National Institutes of Health Guidelines for Research Using Human Pluripotent Stem Cells, 65 Fed. Reg. at 51,979.

⁸⁴ *On Human Embryos and Medical Research: An Appeal for Ethically Responsible Science and Public Policy*, 16 ISSUES L. & MED. 261, 266 (2001). This claim, however, is now being

embryos by pulling out the stem cells but may be used on the fruits of destruction already performed through private funding.⁸⁵

In 2001, Congress considered several bills on stem cell research.⁸⁶ On April 5, 2001, the Stem Cell Research Act was introduced in the Senate.⁸⁷ The purpose was to “provide for human embryonic stem cell generation and research.”⁸⁸ If passed, the Act would allow research only on cells derived from embryos donated from IVF clinics.⁸⁹ An identical bill was introduced in the House of Representatives on June 5, 2001.⁹⁰ Neither version mandated embryonic stem cell research as a right, but merely provided the funding for those scientists desiring to perform the research.⁹¹

Another Act, the Responsible Stem Cell Research Act, was introduced in both the House and Senate in the summer of 2001.⁹² This

challenged, as an embryonic stem cell may possess the ability to grow back into an embryo. CBHD, *supra* note 25. If such studies reveal that stem cells really do develop back into human embryos, then “research on such stem cells could itself involve the creation and/or destruction of human life and would thereby certainly fall under the existing ban on federally-funded embryo research.” *Id.*

⁸⁵ See National Institutes of Health Guidelines for Research Using Human Pluripotent Stem Cells, 65 Fed. Reg. at 51,979. The federal funding of stem cell research on cells harvested by private firms is viewed as a mere “loophole” in the law. Nelle S. Paegel, Note, *Use of Stem Cells in Biotechnological Research*, 22 WHITTIER L. REV. 1183, 1184 (2001).

⁸⁶ See *infra* notes 87-95 and accompanying text. However, due to the national tragedy on September 11, 2001, these bills were placed on hold. Adams, *supra* note 40, at 123.

⁸⁷ S. 723, 107th Cong. (2001). Senator Specter introduced the bill along with Senators Harkin, Thurmond, Chafee, Smith of Oregon, Hollings, Reid, Murray, Clinton, Corzine, Feinstein, Kerry, and Inouye. *Id.* The bill was read twice and then referred to the Committee on Health, Education, Labor, and Pensions but went no further. *Id.*; see also *Bill Summary & Status for the 107th Congress*, available at <http://thomas.loc.gov/> (last visited Nov. 1, 2002) [hereinafter *Bill Summary & Status*].

⁸⁸ S. 723. The Act would amend the Public Health Service Act, located at 42 U.S.C. § 289, by adding § 498c. *Id.*

⁸⁹ *Id.* Additional requirements included that the embryos were never going to be implanted into a woman and that the embryos were donated with the written informed consent of the progenitors. *Id.* § 498c(b)(1). In addition, the Act prohibited research on the embryos that resulted in the creation of human embryos or reproductive cloning. *Id.* § 498c(c)(1)(B).

⁹⁰ H.R. 2059, 107th Cong. (2001). Congressman McDermott introduced the bill. *Id.* The bill was referred to the House Committee on Energy and Commerce and then to the Subcommittee on Health. *Id.* No further action was taken. See *Bill Summary & Status, supra* note 87.

⁹¹ See H.R. 2059; S. 723.

⁹² H.R. 2096, 107th Cong. (2001); S. 1349, 107th Cong. (2001). In the House of Representatives, Congressman Chris Smith and thirty-eight others introduced the bill. H.R. 2096. The bill was subsequently referred to the House Committee on Energy and

Act called for the creation of a National Stem Cell Donor Bank for human stem cells.⁹³ The Act would not allow the Bank to house embryonic stem cells.⁹⁴ Both versions of this bill appropriated funds for the creation of the Bank and subsequent adult stem cell research.⁹⁵

In August 2001, President George W. Bush announced that federal funds cannot be used to harvest stem cells from embryos.⁹⁶ However, funds may support research with stem cell lines developed before his August announcement.⁹⁷ President Bush's decision seemed to create a "happy medium" between the pro-life opponents, who were grateful that no more embryos would be destroyed, and the embryonic research supporters, who were encouraged to continue research on the available stem cell lines.⁹⁸

Yet at the heart of all these laws and decisions, the question still rings: *what is the moral status of the embryo?*⁹⁹ The United States Supreme

Commerce, which in turn referred it to the Subcommittee on Health. See *Bill Summary & Status*, *supra* note 87. The bill went no further. See *id.* In the Senate, the bill was introduced by Senators Ensign and Brownback. S. 1349. After reading the bill twice and referring it to the Committee on Health, Education, Labor, and Pensions, the Senate took no further action on the bill. See *Bill Summary & Status*, *supra* note 87.

⁹³ H.R. 2096; S. 1349. Human stem cells are cells obtained from placentas, umbilical cord blood, organs, and tissues. H.R. 2096 § 3(b); S. 1349 § 3(b). The Donor Bank would then make the cells available for biomedical research and therapeutic purposes. H.R. 2096 § 3(a); S. 1349. Unlike the Stem Cell Research Act, the Responsible Stem Cell Research Act provided that the Donor Bank would actively seek donors, as well as establish donor criteria to protect both the donors and the transplant recipients and to prevent the transmission of disease. H.R. 2096 § 3(c); S. 1349.

⁹⁴ See H.R. 2096; S. 1349.

⁹⁵ H.R. 2096 § 4(b); S. 1349 § 4(b).

⁹⁶ Ezzell, *supra* note 60, at 51. The Administration effectively withdrew the portions of the NIH's Guidelines that were inconsistent with the President's announced policy. Adams, *supra* note 40, at 114.

⁹⁷ Ezzell, *supra* note 60, at 51.

⁹⁸ Justin Gillis & Ceci Connolly, *Bush Policy on Stem Cells Appears Safe on Hill*, THE WASH. POST, Sept. 2, 2001, at A15. Proponents of embryonic stem cell research question whether the cell lines will be as helpful as the Bush administration asserts but are satisfied that some research will continue. *Id.* Alternatively, opponents of the research are displeased that the research is not completely prohibited but are content that the President's plan discourages more destruction. *Id.*

⁹⁹ Baylis, *supra* note 70, at 52; see also Adams, *supra* note 40, at 111 ("The debate about whether to federally fund human embryonic stem cell research is at root a controversy about the legal status that should be accorded the human embryo."). Even those supporting embryonic research acknowledge that "there is a wide consensus that embryos deserve 'special respect' because they have completed the first steps after fertilization toward becoming a newborn child." John A. Robertson, *In the Beginning: The Legal Status of Early Embryos*, 76 VA. L. REV. 437, 515 (1990).

Court has never answered this question.¹⁰⁰ However, the Court's decisions on abortion, privacy, and the state's interest in potential life provide some guidance.¹⁰¹

C. *Abortion: Privacy and the State's Interest in Potential Life*

A number of legal issues arise in the stem cell debate, including privacy and the state interest in protecting potential life. The Supreme Court has addressed these issues in cases overruling state abortion statutes.¹⁰² In *Roe v. Wade*,¹⁰³ the Court framed the right to terminate a pregnancy as a privacy right.¹⁰⁴ Although acknowledging that the right of privacy is not explicitly mentioned in the Constitution, the Court stated that such a right can be found in the First,¹⁰⁵ Fourth,¹⁰⁶ and Fifth¹⁰⁷

¹⁰⁰ See Andrews, *supra* note 14, at B1. The United States is not the only nation grappling with the stem cell issue. See G.V., *Stem Cell Scorecard*, 290 SCI. 1673 (Dec. 1, 2000). In Japan, the Council for Science and Technology is expected to release guidelines governing the use of stem cells. *Id.* Until that time, scientists are not allowed to derive or even work with embryonic stem cells. *Id.* In Germany, scientists may not perform any research that harms embryos. *Id.* However, that prohibition does not extend to research on imported stem cell lines. *Id.* In Australia, the policies relating to stem cell research vary from state to state. *Id.* For example, the State of Victoria prohibits the derivation of embryonic stem cells, while other states do not. *Id.* The European Union backs all types of stem cell research but particularly pushes research on adult stem cells. *Id.*

¹⁰¹ See *infra* Part II.C.

¹⁰² See *Stenberg v. Carhart*, 530 U.S. 914 (2000); *Planned Parenthood v. Casey*, 505 U.S. 833 (1992); *Roe v. Wade*, 410 U.S. 113 (1973).

¹⁰³ 410 U.S. at 113.

¹⁰⁴ *Id.* at 153. "The woman's right to terminate her pregnancy before viability is the most central principle of *Roe v. Wade*." *Casey*, 505 U.S. at 871.

¹⁰⁵ U.S. CONST. amend. I. The First Amendments declares that "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances." *Id.*

¹⁰⁶ U.S. CONST. amend. IV. The Fourth Amendment states:

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

Id.

¹⁰⁷ U.S. CONST. amend. V. The Fifth Amendment states:

No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be subject for the same offence to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against

Amendments, in the penumbras of the Bill of Rights,¹⁰⁸ and in the concept of liberty in the Fourteenth Amendment.¹⁰⁹ As structured by the Court, a woman's privacy interests in terminating pregnancy revolve around the physical and emotional effects of the pregnancy.¹¹⁰ However, privacy is not an unqualified, absolute right, and at some point the state interest in protecting prenatal life trumps the privacy interests of the mother.¹¹¹

In *Roe*, the Court acknowledged that the State of Texas possessed an important and legitimate interest in protecting potential life.¹¹² The Court viewed this interest as "separate and distinct" from the interest in protecting the health of the mother.¹¹³ Concluding that each interest becomes compelling at some point during pregnancy, the Court found that the State's interest in protecting potential life begins at viability.¹¹⁴

himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

Id.

¹⁰⁸ U.S. CONST. amends. I-X.

¹⁰⁹ *Roe*, 410 U.S. at 152. Section one of the Fourteenth Amendment states that "[n]o State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law." U.S. CONST. amend. XIV, § 1. The right of privacy also extends in some respect to marriage, procreation, contraception, family relationships, and child rearing and education. *Roe*, 410 U.S. at 152-53.

¹¹⁰ *Id.* at 153. The Court spelled out the maternal interests in competition with the state interest. *Id.* For example, there may be specific and direct medical harm, as well as psychological harm, associated with the pregnancy. *Id.* Maternity may force the woman into a "distressful life and future." *Id.* Caring for children may "tax" the mother mentally and physically. *Id.* The Court also recognized that there is stress involved in an unwanted pregnancy and that "there is a problem of bringing a child into a family already unable, psychologically and otherwise, to care for it." *Id.* Finally, the Court acknowledged the mother's interest in avoiding the stigma of unwed motherhood. *Id.*

¹¹¹ *Id.* at 154, 155. The Court stated,

[I]t is reasonable and appropriate for a State to decide that at some point in time another interest, that of health of the mother or that of potential human life, becomes significantly involved. *The woman's privacy is no longer sole* and any right of privacy she possesses must be measured accordingly.

Id. at 159 (emphasis added). Thus, these state interests become dominant at some point during pregnancy. *Id.* at 155. Other state interests include safeguarding health and maintaining medical standards. *Id.* at 154.

¹¹² *Id.* at 162.

¹¹³ *Id.*

¹¹⁴ *Id.* at 163. Viability is the point at which the fetus is capable of maintaining a "meaningful life" outside of the womb. *Id.* The Court proliferated a trimester framework

The Court affirmed this decision in *Planned Parenthood v. Casey*.¹¹⁵ The plurality maintained that the state has a legitimate interest from the very beginning of a pregnancy to protect potential life.¹¹⁶ Quoting from *Roe* that the state has an "important and legitimate interest in potential life," the Court noted that the state interest had not been recognized nor implemented enough in judicial decisions.¹¹⁷ The Court replaced the trimester framework in *Roe* with the "undue burden" standard, claiming that the trimester framework undervalued the state's interest in potential life and did not fulfill *Roe's* promise that a state has an interest in the protection of life.¹¹⁸ The Court then recognized that the state has a substantial interest in potential life throughout pregnancy.¹¹⁹

The most recent Supreme Court decision is *Stenberg v. Carhart*,¹²⁰ where the Court struck down a Nebraska statute banning "partial birth abortion."¹²¹ The Court affirmed both *Roe* and *Casey*, stating that before

for determining the constitutionality of state laws regulating abortion. *Id.* at 164. During the first trimester, the decision to have an abortion must be left to the woman and her physician, and the state can in no way interfere. *Id.* The state can regulate abortion procedures to an extent during the second trimester, so long as it is in the interest of the health of the mother. *Id.* During the third trimester, after viability, the state may regulate abortion in the interest of potential human life. *Id.* at 164-65.

¹¹⁵ 505 U.S. 833, 864, 869 (1992). The Court saw *Roe* as a "rule . . . of personal autonomy and bodily integrity" and recognized that it is a "constitutional liberty" for a woman to have some freedom to have an abortion. *Id.* at 857, 869. However, the Court did reject the trimester framework set forth in *Roe*. *Id.* at 873. Instead, "[o]nly where state regulation imposes an undue burden on a woman's ability to make this decision does the power of the State reach into the heart of the liberty protected by the Due Process Clause." *Id.* at 874. Thus, the Court replaced the trimester framework with the "undue burden" standard. *Id.* at 873-74.

¹¹⁶ *Id.* at 846.

¹¹⁷ *Id.* at 871. The Court stated that many decisions after *Roe* went too far, striking down regulations "which in no real sense deprived women of the ultimate decision." *Id.* at 875. These decisions did not reflect that "[n]ot all governmental intrusion is of necessity unwarranted . . ." *Id.*; see also *Coleman v. DeWitt*, 282 F.3d 908, 912 n.1 (6th Cir. 2002) (stating that it is "not clear to what extent the framework [in *Roe*] has ever bound this court in its abortion decisions").

¹¹⁸ *Casey*, 505 U.S. at 875-76.

¹¹⁹ *Id.* at 876. The Court stated,

Roe and subsequent cases treat all governmental attempts to influence a woman's decision on behalf of the potential life within her as unwarranted. This treatment is, in our judgment, incompatible with the recognition that there is a substantial state interest in potential life throughout pregnancy.

Id.

¹²⁰ 530 U.S. 914 (2000).

¹²¹ *Id.* at 922.

viability, the woman has a right to terminate pregnancy.¹²² After viability, the state has an interest in the life and health of the mother and potential child.¹²³ The Court held the Nebraska statute unconstitutional for two reasons.¹²⁴ First, the statute did not contain an exception “for the preservation of the . . . health of the mother.”¹²⁵ Second, the statute imposed “an undue burden on a woman’s ability to choose [a certain type] of abortion.”¹²⁶ While not at the crux of the stem cell debate, these Supreme Court decisions have somewhat influenced the lower courts in evaluating the constitutionality of state bans on embryonic research.¹²⁷

D. Unconstitutional State Bans on Fetal and Embryonic Research

The Supreme Court has never ruled on the constitutionality of state bans on fetal and embryonic research.¹²⁸ In the last fifteen years, the lower courts have struck down only three state statutes prohibiting experimentation on fetuses.¹²⁹ There were two reasons for striking down these laws.¹³⁰ The main reason was that the statutes were

¹²² *Id.*

¹²³ *Id.* Quoting *Casey* and *Roe*, the Court stated, [S]ubsequent to viability, the State in promoting its interest in the potentiality of human life may, if it chooses, regulate, and even proscribe, abortion except where it is necessary, in appropriate medical judgment, for the preservation of the life or health of the mother.

Id. at 921.

¹²⁴ *Id.* at 929-30

¹²⁵ *Id.* at 930.

¹²⁶ *Id.* (quoting *Planned Parenthood v. Casey*, 505 U.S. 833, 879 (1992)).

¹²⁷ See *infra* Part II.D.

¹²⁸ See *Andrews*, *supra* note 14, at B1.

¹²⁹ See *Jane L. v. Bangerter*, 61 F.3d 1493 (10th Cir. 1995) (ruling that Utah’s ban on fetal experimentation was unconstitutionally vague), *rev’d. on other grounds sub nom. Leavitt v. Jane L.*, 518 U.S. 137, 139 (1996) (holding that a provision regulating abortion up to twenty weeks gestation was unconstitutional but that a different provision regulating abortion was constitutional and severable); *Margaret S. v. Edwards*, 794 F.2d 994, 999 (5th Cir. 1986) (holding unconstitutionally vague Louisiana’s criminal statute prohibiting experimentation on an unborn child or child born as a result of abortion); *Lifchez v. Hartigan*, 735 F. Supp. 1361, 1367 (N.D. Ill. 1990) (holding that an Illinois law prohibiting experimentation violated due process because of vagueness). The courts have also upheld statutes prohibiting experimentation. See, e.g., *Wolfe v. Schroering*, 388 F. Supp. 631, 638 (W.D. Ky. 1974), *aff’d in part, rev’d in part on other grounds*, 541 F.2d 523 (6th Cir. 1976) (upholding a Kentucky statute prohibiting the experimentation on viable fetuses).

¹³⁰ See generally *supra* note 129.

unconstitutionally vague.¹³¹ A secondary issue regarded interests of the parties involved.¹³²

With aggressive regulations on the use of embryos and embryonic research, Louisiana prohibited experimentation on both unborn children and children born after an abortion, unless such experimentation was therapeutic to the child.¹³³ An “unborn child” was defined as existing from the moment of conception.¹³⁴ Thus, experimentation on embryos was prohibited.¹³⁵

In 1986, the Fifth Circuit struck down Louisiana’s law prohibiting experimentation on unborn children in *Margaret S. v. Edwards*.¹³⁶ The court stated that a statute failing to specify a standard of conduct violated the Due Process Clause of the Fourteenth Amendment.¹³⁷ Focusing on the word “experiment,” the court concluded that the statute

¹³¹ See generally *supra* note 129.

¹³² *Lifchez*, 735 F. Supp. at 1376.

¹³³ LA. REV. STAT. ANN. § 40:1299.35.13 (West 2001). This statute states: “No person . . . shall experiment on an unborn child or on a child born as the result of an abortion, whether the unborn child or child is alive or dead, unless the experimentation is therapeutic to the unborn child or child.” *Id.* Many other Louisiana statutes concern a variety of embryonic issues. See, e.g., LA. REV. STAT. ANN. § 9:121 (West 2000) (stating that a “human embryo” is a human ovum created through IVF); *Id.* § 9:122 (stating that no in vitro fertilized ovum can be farmed or cultured solely for research purposes); *Id.* § 9:123 (stating that an in vitro fertilized ovum is a juridical person until it is implanted in the womb); *Id.* § 9:124 (stating that as a juridical person, an in vitro fertilized ovum is to be given an identification, which entitles it to sue or be sued); *Id.* § 9:125 (stating that an in vitro fertilized human ovum is “recognized as a separate entity apart from the medical facility or clinic where it is housed or stored”); *Id.* § 9:129 (stating that a viable in vitro fertilized human ovum is a juridical person who cannot be intentionally destroyed through the actions of any other person and implying that an embryo in the state of cryopreservation is viable); *Id.* § 9:130 (stating that if the IVF parents renounce their parental rights, the embryos are available for adoption); *Id.* § 9:131 (stating that in disputes regarding the in vitro fertilized ovum, the standard to use in resolving the disputes is “the best interest of the in vitro fertilized ovum”); see also *id.* § 9:126, which states that the “in vitro fertilized human ovum is a biological human being [and] is not the property of the physician,” the facility in which it resides, or the donors of the egg and sperm. *Id.* If the donors express their identity as parents, then their rights as parents are preserved. *Id.* However, if the donors fail to express their identity as parents, the physician becomes a temporary guardian until the embryo is adopted. *Id.*

¹³⁴ LA. REV. STAT. ANN. § 40:1299.35.1(2). The statute states that an unborn child is “the unborn offspring of human beings from the moment of conception through pregnancy and until termination of the pregnancy.” *Id.*

¹³⁵ *Id.*; *Id.* § 40:1299.35.13.

¹³⁶ 794 F.2d 994, 995, 999 (5th Cir. 1986).

¹³⁷ *Id.*; see also *Ferguson v. Estelle*, 718 F.2d 730, 735 (5th Cir. 1983) (stating that a statute is unconstitutionally vague if “inherently standardless, enforceable only on the exercise of an unlimited, and hence arbitrary, discretion vested in the state”).

was vague because a physician would not be able to distinguish whether a procedure was an "experiment" or a "test" and would, therefore, be held to a standardless prohibition.¹³⁸ For example, one witness pointed out that all standard tests were at one time experiments.¹³⁹ The court noted that, because "tests" and "experiments" may overlap, even some medical treatments may fall into the broad category of experimentation.¹⁴⁰ Thus, the court concluded that the difference between a medical experiment and a medical test was "almost meaningless."¹⁴¹ However, the court hypothesized that the legislative reasoning for the statute was to remove any incentives for "research-minded physicians" to promote abortion.¹⁴² The court then noted that the statute was "rationally related to an important state interest."¹⁴³ Therefore, the court acknowledged that a state's interest in removing incentives to promote abortions is an important governmental interest.¹⁴⁴ The court also indicated that Louisiana did have the power to regulate medical experimentation and that a statute with more clearly defined terms may have resulted in a different conclusion.¹⁴⁵

Illinois also promulgated a law prohibiting nontherapeutic experimentation on fetuses.¹⁴⁶ Because the statute did not define the

¹³⁸ *Margaret S.*, 794 F.2d at 999.

¹³⁹ *Id.* Every medical test becomes "standard" through a gradual process of observing results, confirming benefits, and modifying techniques. *Id.* The witness added, [W]e have at one end things that are obviously standard tests and [at] the other end things that are complete experimentation. But in the center there is a very broad area where diagnostic procedures of testing types overlap with experimentation procedures.

Id. (alteration in original).

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² *Id.* at 998 n.11.

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ *Id.* at 999 n.13. The court stated,

This of course does not imply that the states are powerless to regulate medical experimentation. Because of the nature of the vagueness doctrine, any holding that a statute is unconstitutionally vague must necessarily be highly case-specific. A statute using more precise language than that used in R.S. 40:1299.35.13, whether it applied to fetal experimentation or other forms of medical research, would present a different case than the one we decided today.

Id.

¹⁴⁶ See *Lifchez v. Hartigan*, 735 F. Supp. 1361, 1363 (N.D. Ill. 1990). Chapter 38, § 6(7) of the Illinois Revised Statutes provided:

terms “experiment” and “therapeutic,” the court in *Lifchez v. Hartigan*¹⁴⁷ stated that it failed to “alert persons of common intelligence to what conduct is unlawful.”¹⁴⁸ Consequently, it was held unconstitutionally vague.¹⁴⁹

The court in *Lifchez* noted that there were four possible interpretations of the word “experiment” as used in the Illinois statute.¹⁵⁰ One possible interpretation was where the subject being experimented upon gains no direct benefit and the scientist does the research merely to increase his own knowledge.¹⁵¹ Another possibility was any procedure that has not been exhaustively tested to reach a predictable status.¹⁵² In addition, a procedure can be experimental when a particular physician performs it for the first time.¹⁵³ The last interpretation included any medical treatment where a physician takes what he learns in one procedure and applies it to the next.¹⁵⁴ Because the statute did not indicate which definition of experimentation applied, enforcement

No person shall sell or experiment upon a fetus produced by the fertilization of a human ovum by a human sperm unless such experimentation is therapeutic to the fetus thereby produced. Intentional violation of this section is a Class A misdemeanor. Nothing in this subsection (7) is intended to prohibit the performance of in vitro fertilization.

Id. at 1363. The court in *Lifchez* stated that the term “embryo” was included in the legislature’s use of “fetus.” *Id.* at 1368. The court noted that “legislators and courts commonly—and incorrectly—elide” the terms fetus and embryo. *Id.*

¹⁴⁷ *Id.* at 1363.

¹⁴⁸ *Id.* at 1376. The court stated that not only did the vague terms make it difficult for a physician to determine what conduct is lawful, but the terms also created a situation where the interests of the woman and the embryo may be competing for therapy from a physician. *Id.* at 1370.

¹⁴⁹ *Id.*

¹⁵⁰ *Id.* at 1364-65; see *infra* notes 151-54 and accompanying text.

¹⁵¹ *Lifchez*, 735 F. Supp. at 1365. The State had characterized such experimentation as “just for the scientific thrill” of it. *Id.*

¹⁵² *Id.* This is the definition typically used by insurance companies when denying coverage for unrecognized procedures. *Id.*

¹⁵³ *Id.* The court noted that the third definition was the definition used by the American Fertility Society. *Id.*

¹⁵⁴ *Id.* The court analogized this definition of experimentation with that utilized in the federal regulations. *Id.* According to the federal regulations, “research” is defined as a “systematic investigation . . . designed to develop or contribute to generalizable knowledge.” *Id.*; see also 45 C.F.R. § 46.102(d) (2000). Such research includes research development, testing, and evaluation. 45 C.F.R. § 46.102(d).

officials did not have a clear standard of what procedures were unlawful.¹⁵⁵

Other aspects of the statute also concerned the court.¹⁵⁶ Because an experiment may at some point become a routine procedure, the mere passage of time may change an action from being unlawful to lawful.¹⁵⁷ The court stated that a statute is unconstitutionally vague if the mere passage of time may change the legality of a procedure.¹⁵⁸ In addition, the court noted concerns about the privacy interests of the women.¹⁵⁹ Because the statute may intrude upon procedures such as embryo transfer and chorionic villi sampling, the court ruled that the statute impermissibly restricted a woman's fundamental right of privacy and her right to make decisions free from governmental interference.¹⁶⁰

In addition, the statute contained a scienter requirement, stating that only intentional violations of the statute would result in a misdemeanor conviction.¹⁶¹ Thus, physicians who did not realize they were breaking a law would not be convicted under the statute.¹⁶² But the court held that a scienter requirement does not mitigate vagueness problems when a statute has "no core meaning" from the start.¹⁶³

¹⁵⁵ *Lifchez*, 735 F. Supp. at 1365. The court stated that it was hard to know where, along the broad spectrum of possible meanings for "experiment," to fit the procedures performed by the doctors in the case. *Id.*

¹⁵⁶ *Id.* at 1367, 1376.

¹⁵⁷ *Id.* at 1367.

¹⁵⁸ *Id.*

¹⁵⁹ *Id.* at 1376. In particular, the court noted a woman's fundamental privacy right to "make reproductive choices free of governmental interference with those choices," and, more specifically, the decision whether or not to beget or bear a child. *Id.*

¹⁶⁰ *Id.* at 1367-68. Embryo transfer can be used to help infertile women become pregnant. *Id.* at 1367. The procedure involves removing the embryo from the uterus of one woman and implanting it in the infertile woman. *Id.* Chorionic villi sampling involves taking a biopsy by snipping off some of the tissue surrounding the embryo. *Id.* The process provides genetic information about the fetus to the pregnant mother. *Id.* Because these procedures can be perceived as nontherapeutic to the embryo, the court concluded that such procedures would violate the Illinois statute as it stood. *Id.*

¹⁶¹ *Id.* at 1372. "Scienter" is defined as "[a] degree of knowledge that makes a person legally responsible for the consequences of his or her act or omission." BLACK'S LAW DICTIONARY 1347 (7th ed. 1999). Thus, in order for a person to be subject to civil or criminal punishment, a "scienter requirement" demands that an act is done knowingly. *Id.*; *Lifchez*, 735 F. Supp. at 1372.

¹⁶² *Lifchez*, 735 F. Supp. at 1372.

¹⁶³ *Id.* A statute has "no core meaning" when a specific standard of conduct is not specified. *Margaret S. v. Edwards*, 794 F.2d 994, 999 (5th Cir. 1986). In *Smith v. Goguen*, the court specified two different types of vagueness. 415 U.S. 566, 578 (1974). In one sense, a

The court highlighted three ways in which vagueness violates due process.¹⁶⁴ First, a vague statute does not give a person notice of exactly what conduct is unlawful.¹⁶⁵ Second, a lack of definite terms allows for arbitrary and capricious enforcement.¹⁶⁶ Finally, undefined unlawful conduct and the possibility of arbitrary enforcement invites a chilling effect because people will curtail lawful conduct to avoid facing arrest.¹⁶⁷

A third statute involving embryonic experimentation was struck down in Utah.¹⁶⁸ The statute prohibited experimentation on “live unborn children” unless used to detect genetic defects.¹⁶⁹ In *Jane L. v. Bangerter*,¹⁷⁰ the court held that a number of words and phrases used in the statute were unconstitutionally vague, including “experiment” and “experimentation.”¹⁷¹ The statute did not clearly differentiate between lawful and unlawful conduct, making it difficult for physicians to know what procedures they could lawfully perform.¹⁷² Again, this undefined unlawful activity could cause a chilling effect as physicians abstain from otherwise lawful procedures in order to avoid possible liability.¹⁷³

statute is vague if “it requires a person to conform his conduct to an imprecise but comprehensible” standard. *Id.* (quoting *Coats v. City of Cincinnati*, 402 U.S. 611, 614 (1971)). On the other hand, a statute is vague if there is not a standard of conduct specified at all. *Id.* It is in the latter that courts have found “no core meaning.” *Id.* Such an “absence of any ascertainable standard . . . is precisely what offends the Due Process Clause.” *Id.*; see also *Connally v. Gen. Const. Co.*, 269 U.S. 385, 391 (1926) (stating that “a statute which either forbids or requires the doing of an act in terms so vague that men of common intelligence must necessarily guess at its meaning and differ as to its application violates the first essential of due process of law”).

¹⁶⁴ *Lifchez*, 735 F. Supp. at 1364.

¹⁶⁵ *Id.*

¹⁶⁶ *Id.* For example, “statutory language of such a standardless sweep allows policemen, prosecutors, and juries to pursue their personal predilections.” *Smith*, 415 U.S. at 575.

¹⁶⁷ *Lifchez*, 735 F. Supp. at 1364. When a statute is unclear, such ambiguity will cause people to stay farther from the unlawful zone than they would if the unlawful activity was clearly marked. *Id.*

¹⁶⁸ *Jane L. v. Bangerter*, 61 F.3d 1493 (10th Cir. 1995), *rev’d. on other grounds sub nom. Leavitt v. Jane L.*, 518 U.S. 137 (1996) (holding that a provision regulating abortion up to twenty weeks gestation was unconstitutional but that a different provision regulating abortion was constitutional and severable).

¹⁶⁹ UTAH CODE ANN. § 76-7-310 (1999). Section 76-7-310 states: “Live unborn children may not be used for experimentation, but when advisable, in the best medical judgment of the physician, may be tested for genetic defects.” *Id.*

¹⁷⁰ 61 F.3d 1493 (10th Cir. 1995).

¹⁷¹ *Id.* at 1501-02.

¹⁷² *Id.* at 1502.

¹⁷³ *Id.*

The court provided two standards to employ when determining vagueness.¹⁷⁴ First, a law must give a person “of ordinary intelligence a reasonable opportunity to know what is prohibited.”¹⁷⁵ Here, the undefined terms made it nearly impossible for physicians to differentiate between conduct that was prohibited and that which was not.¹⁷⁶ Second, a law must include exact standards of enforcement.¹⁷⁷ Otherwise, the power of enforcement delegated to policemen, judges, and juries will be completely subjective and result in arbitrary and discriminatory application of the law.¹⁷⁸

In addition to the interests of the state and the mother, those in the medical profession have asserted an interest in the performing of research.¹⁷⁹ One court decision, while upholding a statute on fetal experimentation, directly addressed the medical field’s claimed constitutional right to perform fetal research.¹⁸⁰ In *Wynn v. Scott*,¹⁸¹ the court considered another Illinois law aimed at experimentation on fetuses aborted alive.¹⁸² The court stated that a statute prohibiting such experimentation did not burden the mother involved, nor did it place an obstacle in the path of obtaining the abortion.¹⁸³ Instead, the contested provision was within the state’s broad police power.¹⁸⁴ Thus, the court

¹⁷⁴ *Id.* at 1500. The court also noted that different standards are used depending on the type of statute involved. *Id.* If a statute imposes a civil penalty, it is unconstitutionally vague only when it is “vague in all of its applications.” *Id.* If a statute imposes a criminal penalty, it is unconstitutionally vague “even when it could conceivably have had some valid application.” *Id.* Criminal statutes are invalid when the average person is not aware that conduct is unlawful. *Id.*

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

¹⁷⁷ *Id.*

¹⁷⁸ *Id.*

¹⁷⁹ See *Wynn v. Scott*, 449 F. Supp. 1302 (N.D. Ill. 1978), *aff’d sub nom.* *Wynn v. Carey*, 599 F.2d 193 (7th Cir. 1979).

¹⁸⁰ *Id.*

¹⁸¹ *Id.*

¹⁸² *Id.* at 1322. The Illinois statute stated:

No person shall use any fetus or premature infant aborted alive for any type of scientific, research, laboratory or other kind of experimentation either prior to or subsequent to any abortion procedure except as necessary to protect or preserve the life and health of such premature infant aborted alive.

Id. (citing § 6(3) of the Illinois Abortion Act of 1975).

¹⁸³ *Id.*

¹⁸⁴ *Id.* The court stated that the contested provisions of the statute were “within the category of social and health matters which states are given broad latitude to regulate.” *Id.*

concluded that the provision did not infringe a constitutional right.¹⁸⁵ In addition, the court stated that medical researchers do not have fundamental rights under the Constitution to perform research.¹⁸⁶ Because no fundamental rights were involved, the state merely had to possess a rational connection between its asserted interest and the regulation.¹⁸⁷ This court's holding, along with the holdings in *Margaret S.*,¹⁸⁸ *Lifchez*,¹⁸⁹ and *Jane L.*,¹⁹⁰ work together to create standards for analyzing the potential vagueness problems of current state laws banning embryonic experimentation.

III. EVALUATING CURRENT STATE STATUTES BANNING EMBRYONIC EXPERIMENTATION

Several states still uphold laws banning or regulating embryonic research.¹⁹¹ A number of factors must be considered in evaluating the constitutionality of these statutes. This Part will first set forth a framework for analyzing these current statutes, based on the standards created through the Supreme Court and lower court decisions discussed

¹⁸⁵ *Id.*

¹⁸⁶ *Id.* It is still argued, however, that research is "rooted in the traditions and conscience of our people as to be ranked fundamental." Elizabeth Price Foley, *The Constitutional Implications of Human Cloning*, 42 ARIZ. L. REV. 647, 696 (2000).

¹⁸⁷ *Wynn*, 449 F. Supp. at 1322. The court ruled that a rational connection did exist between the regulation and the state's interest. *Id.*

¹⁸⁸ See *supra* notes 136-45 and accompanying text.

¹⁸⁹ See *supra* notes 147-67 and accompanying text.

¹⁹⁰ See *supra* notes 170-78 and accompanying text.

¹⁹¹ See FLA. STAT. ANN. § 390.011(6) (West 2002) (banning the use of any live fetus "for any type of scientific, research, laboratory, or other kind of experimentation"); LA. REV. STAT. ANN. § 9:129 (West 2000) (prohibiting the destruction of any in vitro fertilized human ovum); ME. REV. STAT. ANN. tit. 22, § 1593 (West 1992) (stating that the use of intrauterine and extrauterine human fetuses or products of conception cannot be used for scientific or any form of experimentation); MICH. COMP. LAWS ANN. § 333.2685 (West 2001) (prohibiting research on embryos if the research will substantially jeopardize the life or health of the embryo); MINN. STAT. § 145.422 (1998) (stating that anyone who uses a living human conceptus for experimentation that is not harmless to the embryo is guilty of a gross misdemeanor); N.M. STAT. ANN. § 24-9A-3 (Michie 2000) (stating that a fetus cannot be used for clinical research unless "the purpose of the activity is to meet the health needs of the particular fetus and the fetus will be placed at risk only to the minimum extent necessary to meet such needs or no significant risk to the fetus is imposed by the research activity"); 18 PA. CONS. STAT. § 3216 (2000) (stating that "any person who knowingly performs any type of nontherapeutic experimentation or nontherapeutic medical procedure" upon an unborn child is guilty of a third-degree felony and defining "nontherapeutic" as "that which is not intended to preserve the life or health of the child upon whom it is performed").

in Part II.¹⁹² Next, this Part will evaluate the state laws that ban or regulate embryonic research.¹⁹³

A. *A Framework for Evaluating State Statutes*

Through their rulings on abortion and fetal experimentation statutes, the courts have established a framework through which to evaluate the constitutionality of state bans on embryonic research.¹⁹⁴ Thus far, the statutes have only been struck down based on the impinged privacy interest of the mother or on vagueness grounds.¹⁹⁵

The first consideration when analyzing a state statute is the interests of the parties involved. In the Supreme Court cases, the Court balanced the mother's privacy interest against the state's interest in potential life.¹⁹⁶ As stated in the Court's decisions, the mother's privacy interests deal only with the physical and mental aspects of pregnancy.¹⁹⁷ In *Roe*, the mother's right was framed as the right to terminate pregnancy.¹⁹⁸ *Casey* emphasized that the main principle in *Roe* was the right to end pregnancy and saw it as a rule "of personal autonomy and bodily integrity."¹⁹⁹ The mother's interests in obtaining an abortion also included the distress associated with an unwanted child and the stigma of unwed motherhood.²⁰⁰ Again, these interests involved the physical and emotional aspects of the mother's pregnancy. The medical definition of "pregnancy" involves only an embryo or fetus within the body of the mother.²⁰¹ Stem cell research, however, does not involve

¹⁹² See *infra* Part III.A.

¹⁹³ See *infra* Part III.B.

¹⁹⁴ See *supra* Part II.C-D.

¹⁹⁵ See *supra* Part II.D.

¹⁹⁶ See *supra* Part II.C.

¹⁹⁷ See *Planned Parenthood v. Casey*, 505 U.S. 833, 857, 871 (1992); *supra* note 110 and accompanying text.

¹⁹⁸ *Roe v. Wade*, 410 U.S. 113, 153 (1973). The right of privacy was viewed as "broad enough to encompass a woman's decision whether or not to terminate her pregnancy." *Id.* (emphasis added); see also *Coleman v. DeWitt*, 282 F.3d 908, 912 (6th Cir. 2002) (stating that the essential holding in *Roe* was a recognition of a woman's right to choose to have an abortion, with this right resting at least in part on the woman's interest in self-determination and the effect pregnancy has upon the woman).

¹⁹⁹ *Casey*, 505 U.S. at 857, 871.

²⁰⁰ *Roe*, 410 U.S. at 153; see also *supra* note 110.

²⁰¹ *TABER'S CYCLOPEDIA MEDICAL DICTIONARY 1730* (19th ed. 2001). Pregnancy is medically defined as the "condition of having a developing embryo or fetus in the body after successful conception." *Id.*

pregnancy.²⁰² Thus, because the privacy interests asserted in *Roe* revolve around pregnancy and the mother's physical interests are not present in the stem cell debate, these interests cannot be factored into the balance against the state interest when evaluating the constitutionality of bans on embryonic research.²⁰³

The cases following *Roe* reiterate this analysis. Under *Casey*, a mother has a privacy interest in obtaining an abortion without undue burden.²⁰⁴ The state cannot place an undue burden, or substantial obstacle, in the path of a woman wanting an abortion.²⁰⁵ *Stenberg* extended the interpretation in *Casey* of "substantial obstacles" to include a woman's right to choose a particular type of abortion.²⁰⁶ These types of

²⁰² *Casey*, *supra* note 6, at 151 n.8. Again, the embryos used for stem cell research were fertilized in laboratories, outside of the mothers' bodies. *Id.*; see also *supra* notes 7-13 and accompanying text (discussing the IVF procedure).

²⁰³ *Roe*, 410 U.S. at 153. See also *Wynn v. Scott*, 449 F. Supp. 1302, 1322 (N.D. Ill. 1978) *aff'd sub nom.* *Wynn v. Carey*, 599 F.2d 193 (7th Cir. 1979) (holding that a statute aimed at fetal experimentation did not place an obstacle in the path of obtaining an abortion and claiming that such a regulation is within a state's police powers); *Adams*, *supra* note 40, at 118-19 ("[E]ven strong pro-abortion proponents acknowledge that *Roe v. Wade* has no necessary bearing upon the ex utero living human embryo where maternal and fetal rights are not in opposition.").

²⁰⁴ *Casey*, 505 U.S. at 875-76.

²⁰⁵ *Id.* at 877.

²⁰⁶ *Stenberg v. Carhart*, 530 U.S. 914, 930 (2000). In *Stenberg*, the Court struck down a Nebraska partial-birth abortion statute. *Id.* at 922. The Court used three principles in deciding the case. *Id.* at 921. The first was that a woman has the right to terminate pregnancy before viability. *Id.* The second was that laws imposing undue burdens on the woman's decision before viability are unconstitutional. *Id.* The third was that after viability, states can regulate and even proscribe abortions when necessary to preserve the life or health of the mother. *Id.* The Court ruled the statute unconstitutional because it lacked an exception "for the preservation of the . . . health of the mother" and because it imposed an undue burden on a woman's right to choose a particular abortion procedure. *Id.* at 930. The Court seemed to rest much of its analysis on the fact that the partial-birth abortions were viewed as safer than other procedures. *Id.* at 932. In other words, the mother's main interest was physical safety. *Id.* Thus, like in *Roe*, the Court designated the mother's main interest in abortion as physical. See *Roe*, 410 U.S. at 153. The particular procedure in question, partial-birth abortion, was claimed to be a safer abortion because it "reduces operating time, blood loss and risk of infection; reduces complications from bony fragments; reduces instrument-inflicted damage to the uterus and cervix; prevents the most common causes of maternal mortality (DIC and amniotic fluid loss); and eliminates the possibility of 'horrible complications' arising from retained fetal parts." *Stenberg*, 530 U.S. at 932. Yet these health interests are not present with embryonic experimentation. See *supra* notes 7-13 and accompanying text (discussing the IVF procedure). In fact, the physical health and safety of the mother is not an interest at all. See *supra* notes 197-203 and accompanying text.

obstacles once more involve the mother's physical and health interests, which are not present with stem cell research.

In contrast, the state's interest in protecting human life is present in both abortion cases and in the stem cell research debate. In *Roe*, the Court claimed that the state does have an important and legitimate interest in protecting human life and that at some point this interest becomes compelling.²⁰⁷ The Court also held that there is a state interest in maintaining medical standards.²⁰⁸ In *Casey*, the Court extended *Roe* by stating that the state has a substantial interest in potential life from the time of conception until birth.²⁰⁹ Unlike the mother's interests, the state's interests are both acknowledged by the Court and apply to the stem cell debate.²¹⁰ The state has an interest in potential life from the moment of conception, whether that conception takes place inside a woman's body or in a laboratory.²¹¹

Another aspect of stem cell research not present in the abortion decisions involves the interests of scientists in conducting experimentation on embryos. *Roe* found only personal privacy rights

²⁰⁷ *Roe*, 410 U.S. at 162-63. The Court declared that "it is reasonable and appropriate for a State to decide that at some point in time another interest, that of the health of the mother or that of potential human life, becomes significantly involved." *Id.* at 159. At that point, the woman's privacy right is no longer sole and will not weigh as heavily against the state's interest in life. *Id.* Thus, the right of privacy is not absolute. *Id.* at 154.

²⁰⁸ *Id.* at 154. The state's interests in regulation are important and should be weighed accordingly. *Id.* The Court acknowledged that some state regulation in the area protected by the right of privacy is appropriate. *Id.* A state can "assert important interests in safeguarding health, in maintaining medical standards, and in protecting potential life." *Id.*

²⁰⁹ *Casey*, 505 U.S. at 876.

²¹⁰ In other words, the mother's interest is asserted by the Court in abortion decisions, but it is not present in the stem cell debate. See generally Part III.A. The state's interest alone transcends the line between the Court's abortion and embryonic research decisions. In *Coleman v. DeWitt*, the Sixth Circuit concluded that a state's interest in the protection of fetal life does not need to be compelling in order to justify some regulations. 282 F.3d 908, 913 (6th Cir. 2002). The case involved an involuntary manslaughter conviction of a man who kicked his pregnant girlfriend, triggering a miscarriage. *Id.* at 910. Because punishing the man's actions did not implicate the woman's rights in any way, the state did not have to demonstrate a compelling interest. *Id.* at 913. Thus, the state only needed to show a rational basis for the punishment. *Id.* at 913 n.2.

²¹¹ In *Davis v. Davis*, the court concluded that preembryos, while neither strictly "persons" nor "property," occupy an interim category entitling them to "special respect because of their potential for human life." 842 S.W.2d 588, 597 (Tenn. 1992). However, the court, rendering its decision in the same year as *Casey*, had not benefited from *Casey*'s statement that states have an interest in life even in the first trimester. See *Casey*, 505 U.S. at 876. Thus, *Davis* must be interpreted in light of the Supreme Court's holding in *Casey*. *Id.*

fundamental.²¹² Thus, a researcher cannot assert a right to use embryos for stem cell research, as that right is not personal *per se*.²¹³

The lower courts echo the Supreme Court on the privacy issue.²¹⁴ In *Lifchez*, the privacy interests asserted on behalf of the mother were purely physical and thus do not apply to the stem cell debate.²¹⁵ For example, the court's concerns with embryo transfer and chorionic villi sampling are not present in stem cell research, as the embryo is located outside of a woman's body.²¹⁶

Wynn also provides support to states banning stem cell research.²¹⁷ As with stem cell research, the statute in question prohibited experimentation on fetuses that were already located outside of the mother's womb.²¹⁸ Because of the location of the fetuses, there was no obstacle to abortion, and the court ruled that the statute did not burden the mother's rights.²¹⁹ Instead, this type of regulation was found to be within the social and health affairs that states have broad authority to regulate.²²⁰ Thus, because the embryos in stem cell research are outside the mother's body, statutes banning stem cell research do not violate the mother's rights. In addition, the court stated that researchers possess no fundamental rights to use embryos and are not given constitutional

²¹² *Roe*, 410 U.S. at 154. "We, therefore, conclude that *the right of personal privacy* includes the abortion decision . . ." *Id.* (emphasis added).

²¹³ See *Wynn v. Scott*, 449 F. Supp. 1302, 1322 (N.D. Ill. 1978) *aff'd sub nom.* *Wynn v. Carey*, 599 F.2d 193 (7th Cir. 1979) (declaring that medical researchers do not have a fundamental right under the Constitution to experiment on fetuses).

²¹⁴ See *Coleman*, 282 F.3d at 913 ("If we know anything from *Roe*, it is that the State has a legitimate and important interest in protecting fetal life throughout pregnancy, even before viability.").

²¹⁵ *Lifchez v. Hartigan*, 735 F. Supp. 1361 (N.D. Ill. 1990); see *supra* notes 147-67 and accompanying text.

²¹⁶ See *supra* notes 159-60 and accompanying text. Therefore, the mother's "zone of privacy" is not impinged. *Lifchez*, 735 F. Supp. at 1376. In *Lifchez*, this zone was impinged because embryo transfer and chorionic villi sampling were possibly prohibited. *Id.* Bans on embryo experimentation do not fall within the zone of privacy because the embryos are in vitro and not in utero. *Casey*, *supra* note 6, at 151 n.8.

²¹⁷ *Wynn*, 449 F. Supp. at 1322; see also *supra* notes 181-87 and accompanying text.

²¹⁸ *Wynn*, 449 F. Supp. at 1322. The statute prohibited experimentation on fetuses aborted alive. *Id.*

²¹⁹ *Id.*

²²⁰ *Id.* Likewise, a state's regulation of embryonic research would fall within the social and health affairs, which are within the state's authority to regulate. See *id.*

protection to conduct research.²²¹ Therefore, researchers do not possess a constitutional right to conduct stem cell research.

Overall, the balance in *Roe* and *Casey* involves the mother's interest against the state's interest.²²² This balance between interests can be viewed as a scale. On the left side rests the mother's interests in terminating her pregnancy, avoiding the stigma of unwed motherhood, and health concerns. Yet with embryonic experimentation, the mother's interests that are asserted in these cases are missing because the embryo is already outside of the mother's body and does not relate to any of the interests outlined by the Supreme Court.²²³ No mother's interest in research, let alone the interest of a scientist, is even asserted.²²⁴ The interests outlined deal only with her body and lifestyle. On the right side of the scale is the state's interest in protecting human life, which is present and affirmed in *Roe* and *Casey*.²²⁵ Thus, *Roe* and *Casey* can be seen as supporting a strong state interest in protecting potential human life and supporting the constitutionality of state bans on embryonic research.²²⁶ Here, the scale weighs heavily in favor of the state interest. Thus, a "mother's interest" contention against a ban is not a viable argument and should therefore not be taken into consideration when analyzing such bans.²²⁷ The Court-supported state interest in potential

²²¹ *Id.*

²²² *Planned Parenthood v. Casey*, 505 U.S. 833, 875-76 (1992); *Roe v. Wade*, 410 U.S. 113, 163 (1973).

²²³ *Casey*, 505 U.S. at 875-76.

²²⁴ Scholar Lawrence Tribe states that "[b]ut for its biological dependence on the woman, it is at least arguable that the fetus could be regarded as a holder of rights under the due process clause of the fifth and fourteenth amendments, as well as the equal protection clause of the latter." Lawrence H. Tribe, *The Abortion Funding Conundrum: Inalienable Rights, Affirmative Duties, and the Dilemma of Dependence*, 99 HARV. L. REV. 330, 340 (1985). With stem cell research, the frozen embryo is not biologically dependent on the woman. See *supra* notes 7-13 and accompanying text. Thus, according to Tribe, it could be argued that such embryos have Fifth and Fourteenth Amendment rights. Tribe, *supra*, at 340. If so, the government will be obliged to take affirmative action to "minimize the underlying conflict and thereby protect the interests of the fetus as well as the interests of the mother." Tribe, *supra*, at 341.

²²⁵ *Casey*, 505 U.S. at 871, 876; *Roe*, 410 U.S. at 162.

²²⁶ See *Casey*, 505 U.S. at 876 (holding that the state has a substantial interest in potential life throughout pregnancy); *Roe*, 410 U.S. at 162 (stating that Texas has an important and legitimate interest in protecting potential life); see also *Coleman v. DeWitt*, 282 F.3d 908, 912 (6th Cir. 2002) (stating that "the Court in *Roe* recognized that the state had important interests in protecting fetal life").

²²⁷ This analysis does not take into consideration other types of interests, such as property interests in embryos, because those interests were not asserted in either the abortion decisions or the decisions striking down bans on embryonic research. See *supra*

life, however, works to create a type of presumption in favor of state statutes that do not involve the mother's privacy interests as asserted in *Roe* and *Casey*.²²⁸

Part II.C-D. However, some litigation has centered on the argument that embryos are "property." See generally *Davis v. Davis*, 842 S.W.2d 588 (Tenn. 1992). In *Davis*, the court ruled that preembryos are not, strictly speaking, "property." *Id.* at 597. The predicted future litigation regarding property rights in the field of stem cell research deals mostly with patents and intellectual property and not as much with the parents' property interests in determining whether embryos can be donated for scientific purposes. See Judy Sarasohn, *Stem Cell Line Owner Hires a Lobbyist*, THE WASH. POST, Dec. 20, 2001, at A41.

²²⁸ In support of such a presumption, it should be noted that sixteen states maintain laws holding that, for purposes other than abortion, life begins at conception, and at least twenty-one states still possess case law stating that life begins at conception. See ARIZ. REV. STAT. ANN. § 13-1103 (West 2001) (stating that "knowingly or recklessly" killing an unborn child at any stage of its development is manslaughter); CAL. CIV. CODE § 43.1 (West Supp. 2002) (holding that an unborn child is an existing person); CAL. PENAL CODE § 187 (West 1999) (maintaining that unlawfully killing a fetus is murder); 720 ILL. COMP. STAT. ANN. 5/9-1.2 (West 1993 & Supp. 2001) (prohibiting the intentional homicide of an unborn child and maintaining that an unborn child is "any individual of the human species from fertilization until birth"); *Id.* 5/9-2.1 (West 1993) (stating that the killing of an unborn child without a lawful justification is voluntary manslaughter and maintaining that an unborn child is "any individual of the human species from fertilization until birth"); *Id.* 5/9-3.2 (stating that the unintentional killing of an unborn child is involuntary manslaughter and maintaining that an unborn child is "any individual of the human species from fertilization until birth"); *Id.* 5/12-4.4 (holding that intentionally or knowingly causing great harm or permanent disability to an unborn child is battery and maintaining that an unborn child is "any individual of the human species from fertilization until birth"); *Id.* 510/1 (reaffirming that the policy of the State is that an unborn child is a human being from the moment of conception and is a legal person); 740 ILL. COMP. STAT. ANN. 180/2.2 (West 1993) (holding that the state of gestational development of a human being does not foreclose a cause of action); KY. REV. STAT. ANN. § 311.710 (Banks-Baldwin 1997) (declaring that the policy of the State to recognize and protect "the lives of all human beings regardless of their degree of biological development" will be reinstated); LA. REV. STAT. ANN. § 14:2 (West Supp. 2002) (stating that a "person" is a human being from the moment of conception); *Id.* § 9:121 (stating that a human embryo has rights granted by law); *Id.* § 14:32.5 (defining feticide as the killing of an unborn child); *Id.* § 14:32.6 (defining first-degree feticide as an intentional killing); *Id.* § 14:32.7 (defining second-degree feticide as an offense "committed in sudden passion or heat of blood"); *Id.* § 14:32.8 (defining third-degree feticide as the killing by criminal negligence); 1991 La. Acts 26 (affirming the State's belief that "life begins at conception and that life thereafter is a continuum until the time of death"); MASS. GEN. LAWS ANN. ch. 112, § 12K (West 1996) (stating that an unborn child is an individual human life from the time of fertilization); MINN. STAT. ANN. § 609.267 (West Supp. 2001) (defining first-degree assault of an unborn child); *Id.* § 609.268 (criminalizing the injury or death of an unborn child occurring during the commission of a crime); *Id.* § 609.2661 (declaring the intentional killing of an unborn child is murder in the first degree); *Id.* § 609.2662 (stating that the intentional killing of an unborn without premeditation is murder in the second degree); *Id.* § 609.2663 (stating that causing the death of an unborn child by committing eminently dangerous acts and possessing a depraved mind is third-degree murder); *Id.* §

609.2664 (stating that “intentionally causing the death of an unborn child in the heat of passion” is manslaughter in the first degree); *Id.* § 609.2665 (outlining four ways in which manslaughter of an unborn child in the second degree occurs); *Id.* § 609.2671 (defining second-degree assault of an unborn child); *Id.* § 609.2672 (defining third-degree assault of an unborn child); MO. ANN. STAT. § 1.205 (West 2000) (stating that life begins at conception); *Id.* § 188.015 (defining unborn child as the offspring of human beings at any point in its biological development); MONT. CODE ANN. § 41-1-103 (2001) (deeming an unborn child an existing person); *Id.* § 50-20-102 (reaffirming the state’s tradition of protecting all human life and extending inalienable rights to the unborn); N.D. CENT. CODE § 12.1-17.1-01 (1997) (declaring an unborn child to be the offspring of human beings); *Id.* § 12.1-17.1-02 (outlining the aspects of murder of an unborn child); *Id.* § 12.1-17.1-03 (outlining the aspects of manslaughter of an unborn child); *Id.* § 12.1-17.1-04 (criminalizing the negligent homicide of an unborn child); *Id.* § 12.1-17.1-05 (criminalizing the aggravated assault of an unborn child); *Id.* § 12.1-17.1-06 (criminalizing the assault of an unborn child); OKLA. STAT. ANN. tit. 63, § 1-730 (West 1997) (stating that an unborn child is the offspring of humans from the moment of conception); 18 PA. CONS. STAT. ANN. § 3203 (West 2000) (defining unborn child as “an individual organism of the species homo sapiens from fertilization until birth”); S.D. CODIFIED LAWS § 21-5-1 (Michie 1987) (stating that a person causing the death of an unborn child will be liable); *Id.* § 26-1-2 (stating that a child not yet born is an existing person); UTAH CODE ANN. § 76-7-301.1 (1999) (claiming that unborn children have “inherent and inalienable rights”); WIS. STAT. ANN. § 939.24 (West Supp. 2001) (stating that criminal recklessness includes creating risk or harm to an unborn child); *Id.* § 939.25 (including risk and harm to unborn children in the definition of criminal negligence); *Id.* § 939.75 (stating that an unborn child is an individual of the human species from the point of fertilization); *Id.* § 940.01 (mandating that the killing of an unborn child with intent is a felony); *Id.* § 940.04 (stating that an unborn child is a human being from the time of conception); *Id.* § 940.08 (including death to an unborn child as a homicide in the negligent handling of a dangerous weapon); *Id.* § 940.24 (stating that injury to an unborn child through the negligent handling of a dangerous weapon is a felony); *Wolfe v. Isbell*, 280 So. 2d 758, 761 (Ala. 1973) (stating that authorities recognize that an embryo has a separate existence from its mother); *Trent v. State*, 73 So. 834, 836 (Ala. Ct. App. 1916) (recognizing through a medical source that an unborn child acquires the same moral and legal status as other human beings); *Nelson v. Planned Parenthood*, 505 P.2d 580, 586 (Ariz. Ct. App. 1973) (“One cannot gainsay a legislative determination that an embryonic or fetal organism is a ‘life’ [T]he inevitable result is a human being”); *Simon v. Mullin*, 380 A.2d 1353, 1356 (Conn. Super. Ct. 1977) (allowing recovery for prenatal injuries, regardless of viability); *Bonbrest v. Kotz*, 65 F. Supp. 138, 140 (D.D.C. 1946) (holding that from “the viewpoint of the civil law and the law of property, a child en ventre sa mere is not only regarded as a human being, but as such from the moment of conception—which it is in fact”); *Day v. Nationwide Mut. Ins. Co.*, 328 So. 2d 560, 561 (Fla. Dist. Ct. App. 1976) (quoting Prosser as stating that viability does not affect the legal existence of a fetus); *Hornbuckle v. Plantation Pipe Line Co.*, 93 S.E.2d 727, 728 (Ga. 1956) (holding that the moment of time before conception during which an injury is sustained is not controlling in deciding whether there is a cause of action); *Morrow v. Scott*, No. 88, 1849 WL 1714, at *3 (Ga. Nov. 1849) (stating that a child is “in being” from the moment of conception”); *Cheaney v. State*, 285 N.E.2d 265, 268 (Ind. 1972) (establishing that “some sort of independent life begins at conception”); *State v. Harris*, 136 P. 264, 267 (Kan. 1913) (stating that for some legal purposes, an unborn child is considered alive at conception); *Group Health Ass’n v. Blumenthal*, 453 A.2d 1198, 1207 (Md. Ct. Spec. App. 1983) (recognizing a cause of action for the wrongful death of a non-viable fetus); *Vios v. State*, 246 A.2d 313,

The second and only consideration worth evaluating in this context is vagueness.²²⁹ Three factors should be considered in determining whether or not a statute is unconstitutionally vague.²³⁰ First, the statute must have a core meaning.²³¹ In other words, the statute cannot be standardless.²³² It must specify a standard of conduct so that people of common intelligence know what actions are unlawful.²³³ Second, the statute must contain definite terms.²³⁴ Words such as “experiment” and “therapeutic” must be clearly defined to ensure that enforcement of the

315 (Md. Ct. Spec. App. 1968) (stating that life and pregnancy are simultaneous at conception); *Womack v. Buchhorn*, 187 N.W.2d 218, 222 (Mich. 1971) (adopting the reasoning that “justice requires that the principle be recognized that a child has a legal right to begin life with a sound mind and body” and allowing a cause of action for pre-natal injury); *Verkennes v. Corniea*, 38 N.W.2d 838, 840 (Minn. 1949) (recognizing that an unborn child is a human being); *Rodgers v. Danforth*, 486 S.W.2d 258, 259 (Mo. 1972) (allowing the stipulation that “[m]edically, human life is a continuum from conception to death”); *Wallace v. Wallace*, 421 A.2d 134, 137-38 (N.H. 1980) (acknowledging that life may start at conception); *Bennet v. Hymers*, 147 A.2d 108, 110 (N.H. 1958) (adopting the opinion that an unborn child is a separate organism from the moment of conception); *Smith v. Brennan*, 157 A.2d 497, 502 (N.J. 1960) (stating that medical authorities recognize an unborn child as a distinct entity and that the law recognizes that an individual’s rights can be violated even before birth); *Byrn v. N.Y. City Health & Hosp. Corp.*, 286 N.E.2d 887, 888 (N.Y. 1972) (stating that a fetus is a human and “unquestionably alive”); *Kelly v. Gregory*, 125 N.Y.S.2d 696, 697 (N.Y. App. Div. 1953) (stating that a fetus is a separate organism); *Hopkins v. McBane*, 359 N.W.2d 862, 865 (N.D. 1984) (stating that an unborn child is a person); *Williams v. Marion Rapid Transit*, 87 N.E.2d 334, 339-40 (Ohio 1949) (recognizing that in many legal situations, a child is considered in existence from conception); *State v. Ausplund*, 167 P. 1019, 1022 (Or. 1917) (holding that “[f]rom the moment of conception a new life has begun”); *Amadio v. Levin*, 501 A.2d 1085, 1087 (Pa. 1985) (maintaining that an unborn child is a separate individual from the moment of conception); *Presley v. Newport Hosp.*, 365 A.2d 748, 751 (R.I. 1976) (recognizing the view of other courts and medical authorities that an unborn child is a separate entity from the moment of conception); *Sylvia v. Gobeille*, 220 A.2d 222, 223 (R.I. 1966) (stating it is a medical fact that an unborn child is a living human being from conception); *Leal v. C.C. Pitts Sand & Gravel, Inc.*, 419 S.W.2d 820, 822 (Tex. 1967), *rev’g* 413 S.W.2d 825 (Tex. App. 1967) (considering that medical science maintains that life begins at conception and following the dissenting opinion of Justice Cadena in the lower court opinion, *Leal v. C.C. Pitts Sand & Gravel, Inc.*, 413 S.W.2d 825, 828 (Tex. App. 1967)); *Kalafut v. Gruver*, 389 S.E.2d 681, 684 (Va. 1990) (upholding a cause of action for injuries occurring before birth). Other sources indicate that a total of thirty-seven states and the District of Columbia “recognize expressly or impliedly by statute, resolution, and/or court decision that ‘fertilization’ and ‘conception’ initiates the life of a human being.” *Adams, supra* note 40, at 124; *see also Davidson, supra* note 12, at 79 n.19.

²²⁹ *See supra* Part II.D.

²³⁰ *See supra* Part II.D.

²³¹ *See Margaret S. v. Edwards*, 794 F.2d 994, 999 (5th Cir. 1986); *Lifchez v. Hartigan*, 735 F. Supp. 1361, 1372 (N.D. Ill. 1990); *supra* note 163.

²³² *Margaret S.*, 794 F.2d at 999.

²³³ *Id.*; *Lifchez*, 735 F. Supp. at 1376.

²³⁴ *Lifchez*, 735 F. Supp. at 1364.

statute will not be arbitrary or capricious.²³⁵ Third, the statute cannot produce a chilling effect caused by undefined terms and the possibility of arbitrary enforcement.²³⁶ The terms and enforcement clauses of the statute cannot cause researchers and doctors to simply stop experimenting because they fear prosecution.²³⁷ These three factors are used in the next section to evaluate the constitutionality of current state laws banning embryonic research.²³⁸

B. Current State Law on Embryonic Experimentation

States take different approaches when regulating embryonic experimentation.²³⁹ Some states completely ban experimentation on

²³⁵ *Id.*; see also *Jane L. v. Bangerter*, 61 F.3d 1493, 1501-02 (10th Cir. 1995); *Margaret S.*, 794 F.2d at 999. It should be noted, however, that the terms "experiment," "research," and "therapy" are actually terms of art. For example, the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research defined accepted therapy, or "practice," as "interventions that are designed solely to enhance the well-being of an individual patient or client and that have a reasonable expectation of success." THE NATIONAL COMMISSION FOR THE PROTECTION OF HUMAN SUBJECTS OF BIOMEDICAL AND BEHAVIORAL RESEARCH, THE BELMONT REPORT: ETHICAL PRINCIPLES AND GUIDELINES FOR THE PROTECTION OF HUMAN SUBJECTS 2 (1978). On the other hand, "research" is "an activity designed to test a hypothesis, permits conclusions to be drawn, and thereby to develop or contribute to generalizable knowledge." *Id.* at 3. Thus, the distinction between "practice" and "research" is obvious. However, because the courts in *Lifchez*, *Jane L.*, and *Margaret S.* did not regard such terms as terms of art, it is pertinent that states define such words in order to avoid the vagueness issues that plagued the statutes in those decisions. See generally Part II.D.

²³⁶ *Jane L.*, 61 F.3d at 1502; *Lifchez*, 735 F. Supp. at 1364.

²³⁷ *Jane L.*, 61 F.3d at 1502; *Lifchez*, 735 F. Supp. at 1364.

²³⁸ See *infra* Part III.B.

²³⁹ Even those states that do not ban experimentation completely still regulate experimentation on embryos to a degree. Ten states prohibit experimentation on aborted embryos and fetuses. See, e.g., ARIZ. REV. STAT. § 36-2302 (1993) (stating that an embryo resulting from an induced abortion cannot be used for medical experimentation or research unless the purpose of such research is to diagnose a condition in the mother and the abortion was performed for that purpose); ARK. CODE ANN. § 20-17-802 (Michie 2000) (prohibiting research on fetuses born alive as the result of an abortion, unless the research benefits the fetus, and prohibiting research on fetuses born dead after abortion without the consent of the mother); CAL. HEALTH & SAFETY CODE § 123440 (West 1996) (banning the use of aborted products of human conception except that which is beneficial to the life of the fetus); IND. CODE § 16-34-2-6 (1998) (banning all experimentation on aborted fetuses except pathological examinations); MO. REV. STAT. § 188.037 (1996) ("No person shall use any fetus or child born alive for any type of scientific, research, laboratory or other kind of experimentation either prior to or subsequent to any abortion procedure except as necessary to protect or preserve the life and health of such fetus or child aborted alive."); NEB. REV. STAT. § 28-346 (1995) (stating that no child aborted alive can be used for experimentation unless as necessary to preserve the life of the infant); OHIO REV. CODE ANN. § 2919.14 (West 1997) (prohibiting experimentation on the products of human

embryos.²⁴⁰ Others simply limit experimentation before or after expulsion from the mother's womb.²⁴¹ Regardless of the approach, the statutes will be struck down if vague.²⁴²

1. States Completely Banning Experimentation²⁴³

Seven states currently ban embryonic experimentation entirely.²⁴⁴ Although the Louisiana statute banning experimentation on unborn

conception that have been aborted); OKLA. STAT. tit. 63, § 1-735 (2001) (banning the experimentation on children resulting from abortions unless such experimentation is therapeutic to the child); S.D. CODIFIED LAWS § 34-23A-17 (Michie 1994) (stating that a child subject to an induced abortion may not be used in animal or human research); TENN. CODE ANN. § 39-15-208 (1997) (prohibiting experimentation on aborted fetuses without the consent of the mother). North Dakota also prohibits experimentation on fetuses born dead as a result of occurrences other than abortion. N.D. CENT. CODE § 14-02.2-02 (1997). Michigan prohibits experimentation on dead embryos without the consent of the mother. MICH. COMP. LAWS ANN. § 333.2688 (West 2001). Still other states simply regulate aspects of research. See N.H. REV. STAT. ANN. § 168-B:15 (2001) ("No preembryo shall be maintained ex utero in the noncryo-preserved state beyond 14 days post-fertilization development."); see generally N.M. STAT. ANN. § 24-9A-5 (Michie 2000) (providing standards for determining lawful clinical research activity and consent provisions).

²⁴⁰ See *infra* Part III.B.1.

²⁴¹ See *infra* Part III.B.2.

²⁴² See *supra* Part II.D.

²⁴³ When a state bans experimentation on embryos, a person may not be able to get around the law by simply selling or donating embryos for scientists to use in another state because eight states have laws prohibiting such sale of embryos. See KY. REV. STAT. ANN. § 436.026 (Banks-Baldwin 2001) (stating that the sale, transfer, or distribution of a live child resulting from an abortion is a Class B felony); LA. REV. STAT. ANN. § 9:122 (West 2000) (prohibiting the sale of human embryos); ME. REV. STAT. ANN. tit. 22, § 1593 (West 1992) (forbidding the distribution of live human fetuses); MASS. GEN. LAWS ANN. ch. 112, § 12J (West 1996) (prohibiting the sale, transfer, distribution, and donation of fetuses); MINN. STAT. ANN. § 145.422 (West 1998) (stating that "whoever buys or sells a living human conceptus . . . is guilty of a gross misdemeanor"); NEB. REV. STAT. § 28-342 (1995) (forbidding the "sale, transfer, distribution, or giving away" of live children born as a result of abortion); OKLA. STAT. tit. 63, § 1-735 (1997) (stating that the sale of an unborn child is prohibited); WYO. STAT. ANN. § 35-6-115 (Michie 2001) (forbidding the sale, transfer, distribution, and donation of live aborted children). The sale of cell lines, however, may be exempt. For example, it may be legal to sell the stem cells already cultured from an embryo. On the other hand, Minnesota will only allow the sale of cell lines established from nonliving embryos. See MINN. STAT. ANN. § 145.422 (West 1998) (stating that the law does not forbid "the buying and selling of a cell culture line or lines taken from a nonliving human conceptus"). Cell lines are created after the stem cells are removed from the embryo and cultured to regenerate indefinitely. *Text of President Bush's Speech, supra* note 13, at A12.

²⁴⁴ See FLA. STAT. ANN. § 390.0111(6) (West 2002) (banning the use of any live fetus "for any type of scientific, research, laboratory, or other kind of experimentation"); LA. REV. STAT. ANN. § 9:129 (West 2000) (prohibiting the destruction of any in vitro fertilized human ovum); ME. REV. STAT. ANN. tit. 22, § 1593 (West 1992) (stating that the use of intrauterine

children was held unconstitutional, the State still maintains a law stating that a “viable in vitro fertilized human ovum” is a juridical person and cannot be intentionally destroyed.²⁴⁵ In this context, the word “viable” does not have the same meaning as it does in Supreme Court jurisprudence. Instead, a “viable in vitro fertilized human ovum” is an embryo that is in a state of development.²⁴⁶ According to the statute, a cryopreserved embryo is considered viable.²⁴⁷ Thus, embryos created in the IVF industry and cryopreserved cannot be used for stem cell research in Louisiana, as removal of the stem cell will necessarily destroy the embryo.²⁴⁸ On the other hand, a non-viable in vitro fertilized ovum is one that fails to develop further over a thirty-six hour period of time.²⁴⁹ In other words, the ovum is already dead, as it is no longer developing toward birth. Such non-viable embryos are available for research because the research will not destroy the life of the embryos. In analyzing the constitutionality of this statute, it should first be acknowledged that the state does have an important interest in the

and extrauterine human fetuses or products of conception cannot be used for scientific or any form of experimentation); MICH. COMP. LAWS ANN. § 333.2685 (West 2001) (prohibiting research on embryos if the research will substantially jeopardize the life or health of the embryo); MINN. STAT. § 145.422 (1998) (stating that anyone who uses a living human conceptus for experimentation that is not harmless to the embryo is guilty of a gross misdemeanor); N.M. STAT. ANN. § 24-9A-3 (Michie 2000) (stating that a fetus cannot be used for clinical research unless “the purpose of the activity is to meet the health needs of the particular fetus and the fetus will be placed at risk only to the minimum extent necessary to meet such needs or no significant risk to the fetus is imposed by the research activity”); 18 PA. CONS. STAT. § 3216 (2000) (stating that “any person who knowingly performs any type of nontherapeutic experimentation or nontherapeutic medical procedure” upon an unborn child is guilty of a third-degree felony and defining “nontherapeutic” as “that which is not intended to preserve the life or health of the child upon whom it is performed”).

²⁴⁵ LA. REV. STAT. ANN. § 9:129 (West 2000). Louisiana defines “human embryo” as an in vitro fertilized human ovum. *Id.* § 9:121.

²⁴⁶ *Id.* § 9:129. The statute states:

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.

²⁴⁷ *Id.*

²⁴⁸ THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at xviii; Quinn, *supra* note 17, at 852.

²⁴⁹ LA. REV. STAT. ANN. § 9:129.

potential life of the embryos.²⁵⁰ Thus, the main consideration is vagueness.

First, a statute must contain a core meaning.²⁵¹ Here, there is a specified standard enabling people of common intelligence to know what is unlawful.²⁵² Louisiana has stated that embryos cannot be destroyed.²⁵³ A person of common intelligence should know that destroying an embryo is unlawful, and actions taken to intentionally destroy an embryo will be punished.²⁵⁴ Second, a statute must contain definite terms to ensure that enforcement will not be arbitrary or capricious.²⁵⁵ Louisiana specifically set out what is and is not considered a "viable in vitro fertilized human ovum."²⁵⁶ Any action that destroys a "viable in vitro fertilized ovum" is simply not allowed. Research on a "non-viable" human ovum is allowed, even if the ovum is destroyed.²⁵⁷ Research on a viable human ovum is allowed when such research will not destroy the ovum.²⁵⁸ While the use of the term "viable" in this context is slightly confusing, the statute does explain the State's use of the word. Thus, the terms make clear which actions are lawful and which are unlawful. Because there is a definite line between lawful and unlawful conduct, the statute does not invite arbitrary or capricious enforcement.

A third requirement is that a statute must not produce a chilling effect caused by undefined terms and the possibility of arbitrary enforcement.²⁵⁹ Because the Louisiana statute's terms are clear and do not invite arbitrary enforcement, the statute is unlikely to produce a chilling effect. However, one argument is that a scientist or doctor may inadvertently destroy a human ovum while performing some other procedure or test. The statute provides that a human ovum cannot be

²⁵⁰ *Planned Parenthood v. Casey*, 505 U.S. 833, 876 (1992); *Roe v. Wade*, 410 U.S. 113, 162 (1973).

²⁵¹ See *Margaret S. v. Edwards*, 794 F.2d 994, 999 (5th Cir. 1986); *Lifchez v. Hartigan*, 735 F. Supp. 1361, 1372 (N.D. Ill. 1990); *supra* note 163.

²⁵² *Lifchez*, 735 F. Supp. at 1364.

²⁵³ LA. REV. STAT. ANN. § 9:129.

²⁵⁴ *Id.*; *Lifchez*, 735 F. Supp. at 1364.

²⁵⁵ *Lifchez*, 735 F. Supp. at 1364.

²⁵⁶ LA. REV. STAT. ANN. § 9:129. The State also avoided the vagueness problems associated with terms such as "experiment" and "nontherapeutic" by not using those terms in prohibiting the destruction of embryos. *Id.*

²⁵⁷ *Id.*

²⁵⁸ *Id.*

²⁵⁹ *Jane L. v. Bangert*, 61 F.3d 1493, 1502 (10th Cir. 1995); *Lifchez*, 735 F. Supp. at 1364

intentionally destroyed.²⁶⁰ Thus, only those people intentionally destroying these embryos are liable for their actions. Overall, the statute appears to avoid the vagueness problems that invalidated past laws.

Michigan also prohibits nontherapeutic research on an embryo if that research “substantially jeopardizes” the embryo’s life.²⁶¹ While a standard stating that conduct that “substantially jeopardizes” the embryo may appear foggy, Michigan’s clearly defined terms develop its core meaning and provide a standard through which scientists can know which procedures are unlawful. Unlike the overturned Illinois statute in *Lifchez*,²⁶² the Michigan statute defines “nontherapeutic” as scientific or laboratory research or experimentation that will not improve the health of the research subject.²⁶³ Michigan also elaborates on permissible “experimentation.”²⁶⁴ Because the statute is not to be read as prohibiting procedures beneficial to the embryo or the mother, experiments such as embryo transfer, which concerned the court in *Lifchez*, will not be prohibited.²⁶⁵ Because the statute possesses a core meaning with clearly defined terms, it is unlikely to lead to a chilling effect of lawful research.

²⁶⁰ LA. REV. STAT. ANN. § 9:129.

²⁶¹ MICH. COMP. LAWS ANN. § 333.2685 (West 2001). This statute states:

A person shall not use a live human embryo, fetus, or neonate for nontherapeutic research if, in the best judgment of the person conducting the research, based upon the available knowledge or information at the approximate time of the research, the research substantially jeopardizes the life or health of the embryo, fetus, or neonate. Nontherapeutic research shall not in any case be performed on an embryo or fetus known by the person conducting the research to be the subject of a planned abortion being performed for any purpose other than to protect the life of the mother.

Id.

See *supra* notes 147-67 and accompanying text.

²⁶² MICH. COMP. LAWS ANN. § 333.2692 (West 2001). More specifically, the statute states that “‘nontherapeutic research’ means scientific or laboratory research, or other kind of experimentation or investigation not designed to improve the health of the research subject.” *Id.*

²⁶⁴ *Id.* § 333.2686. Section 2686 of the statute states:

Sections 2685 to 2691 shall not prohibit or regulate diagnostic, assessment, or treatment procedures, the purpose of which is to determine the life or status or improve the health of the embryo, fetus, or neonate involved or the mother involved.

Id.

²⁶⁵ See *supra* note 160 and accompanying text.

Pennsylvania also maintains a definition of “nontherapeutic” in its ban on the experimentation on unborn children.²⁶⁶ Only experimentation that will preserve the life or health of that particular embryo is permitted.²⁶⁷ However, the statute fails to provide a clear definition of “unborn child[ren].”²⁶⁸ For example, Pennsylvania may have intended for the statute to apply only to those children in utero, rather than in vitro. If so, the interests of the mother are still in place and must be analyzed, and a person of common intelligence may not be alerted as to exactly what conduct is unlawful.²⁶⁹ Thus, while the State does alert physicians as to what type of research will be allowed, it is vague in its use of the words “unborn child,” which could in turn lead to arbitrary or capricious enforcement.²⁷⁰

Minnesota’s statute banning embryonic research outlines both permitted and nonpermitted experimentation.²⁷¹ A “living human conceptus” cannot be used for any research not performed to protect the life of the embryo involved.²⁷² However, if verifiable scientific evidence has shown an experiment to be harmless to the embryo, that experiment may be performed.²⁷³ Thus, the statute sets forth a standard for

²⁶⁶ 18 PA. CONS. STAT. § 3216(a) (2000). The statute states:

Any person who knowingly performs any type of nontherapeutic experimentation or nontherapeutic medical procedure (except an abortion as defined in this chapter) upon any unborn child, or upon any child born alive during the course of an abortion, commits a felony in the third degree. “Nontherapeutic” means that which is not intended to preserve the life or health of the child upon whom it is performed.

Id.

²⁶⁷ *Id.*

²⁶⁸ *See id.*

²⁶⁹ *Margaret S. v. Edwards*, 794 F.2d 994, 999 (5th Cir. 1986); *Lifchez v. Hartigan*, 735 F. Supp. 1361, 1376 (N.D. Ill. 1990).

²⁷⁰ *Lifchez*, 735 F. Supp. at 1364.

²⁷¹ MINN. STAT. ANN. § 145.422 (West 1998). The Minnesota statute states:

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 misdemeanor.

Id. The term “human conceptus” includes embryos fertilized in vitro. *Id.* § 145.421.

²⁷² *Id.* § 145.422.

²⁷³ *Id.* Subdivision 2 of § 145.422 states: “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.*

determining what conduct is lawful: harmless research is allowed but research detrimental to the life of the conceptus is not.²⁷⁴

Minnesota defines "human conceptus" as any human organism, whether conceived inside the womb or through IVF procedures, from the moment of fertilization through the first 265 days.²⁷⁵ However, the use of embryos fertilized in vitro produces an interesting dilemma. When cryopreserved, embryos created through the IVF process can survive indefinitely in a frozen state.²⁷⁶ The question then arises whether time also freezes. The 265 days may simply indicate time spent in gestation, or it may suggest that the embryos can be used 265 days after conception without reference to their gestational age. In other words, a five-day-old cryopreserved embryo may actually be in existence for 266 days while still in its five-day-old state. Although a technicality, it is one that researchers could argue invites arbitrary enforcement due to the indefinite terms.

Maine has one of the more troubling statutes from a constitutional standpoint.²⁷⁷ The statute regulates in three different situations: intrauterine fetuses, extrauterine fetuses, and any products of conception considered "live born."²⁷⁸ One potential problem involves the regulation of experimentation in utero. Because the statute is virtually standardless, physicians and scientists may not know which actions are unlawful. For example, the statute seems to impinge the zone of privacy that concerned the court in *Lifchez*.²⁷⁹ It may or may not prohibit procedures such as chorionic villi sampling or embryo transfer.²⁸⁰ In addition, this aspect of

²⁷⁴ *Id.*; *Margaret S.*, 794 F.2d at 999; *Lifchez*, 735 F. Supp. at 1376.

²⁷⁵ MINN. STAT. ANN. § 145.421 (West 1998) ("Human conceptus" means 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.").

²⁷⁶ Rubin, *supra* note 13, at 1A. Frozen embryos will literally survive for thousands of years. *Id.*

²⁷⁷ ME. REV. STAT. ANN. tit. 22, § 1593 (West 1992). Section 1593 states:

Whoever shall use, transfer, distribute or give away any live human fetus, whether intrauterine or extrauterine, or any product of conception considered live born for scientific experimentation or for any form of experimentation shall be punished by a fine of not more than \$5,000 and by imprisonment for not more than 5 years and any person consenting, aiding or assisting shall be liable to like punishment.

Id.

²⁷⁸ *Id.*

²⁷⁹ See *supra* note 160 and accompanying text.

²⁸⁰ See *supra* note 160 and accompanying text.

the statute raises the privacy interests of the mother and may not be constitutional under *Roe* and *Casey*.²⁸¹ Maine's statute also faces other vagueness problems. For example, even for the extrauterine fetuses, the terms are not definite. The statute forbids "any form of experimentation."²⁸² As such, a chilling effect seems unavoidable.

While there are only seven states that completely ban experimentation, there are a few more states that ban research before or after an embryo is expelled from the mother's womb.²⁸³ The same vagueness standards set forth above can be used in evaluating these statutes.

2. States Banning Experimentation Before and After Expulsion from the Womb

A few states prohibit experimentation on embryos before and after expulsion from the mother's womb.²⁸⁴ These laws pose a potential problem because they also regulate experimentation while the embryo is still within the mother.²⁸⁵ On the other hand, when dealing with embryos that have been expelled from the mother's womb, the same vagueness considerations apply. The Massachusetts statute states that embryos cannot be used "for scientific, laboratory, research, or other kind of experimentation."²⁸⁶ While at first blush the standard appears broad and ill-defined, the statute goes on to explain and define what types of procedures are allowed. For example, procedures that will not

²⁸¹ See *supra* Part II.C.

²⁸² ME. REV. STAT. ANN. tit. 22, § 1593.

²⁸³ See *infra* Part III.B.2.

²⁸⁴ See MASS. GEN. LAWS ANN. ch. 112, § 12J (West 1996); N.D. CENT. CODE § 14-02.2-01 (1997); R.I. GEN. LAWS § 11-54-1 (2000).

²⁸⁵ See Part III.A for a discussion of the mother's interests. However, we are not concerned here with experimentation while the embryo is still inside the mother because this is not an issue for stem cell research purposes. *Casey*, *supra* note 6, at 151 n.8.

²⁸⁶ MASS. GEN. LAWS ANN. ch. 112, § 12J(a)I. The statute provides:

No person shall use any live human fetus whether before or after expulsion from its mother's womb, for scientific, laboratory, research or other kind of experimentation. This section shall not prohibit procedures incident to the study of a human fetus while it is in its mother's womb, provided that in the best medical judgment of the physician, made at the time of the study, said procedures do not substantially jeopardize the life or health of the fetus, and provided said fetus is not the subject of a planned abortion.

Id. While the language of the statute uses the term "fetus," the statute also provides that the term includes embryos. *Id.* § 12J(a)IV.

“substantially jeopardize the life or health of the fetus” are allowed.²⁸⁷ The statute also does not apply to procedures used to determine or preserve the life or health of the embryo or mother involved.²⁸⁸ North Dakota and Rhode Island’s statutes are almost identical to the Massachusetts statute.²⁸⁹

As is seen through these statutes, and those discussed previously, it is difficult to avoid the problem of vagueness when promulgating statutes regulating experimentation. Yet the vagueness standards provided by the courts, along with an understanding of the constitutionality of current state law, provide a framework for drafting constitutional bans on stem cell and embryonic research.²⁹⁰

IV. MODEL STATUTES BANNING EXPERIMENTATION²⁹¹

There are two possible approaches to promulgating a constitutional ban on stem cell research. The first is a more specific statute, banning only stem cell research itself. The second is a more inclusive statute, banning both stem cell research and other types of embryonic experimentation. In either approach, the statutes must be written to substantially weigh the state’s interest, while avoiding issues regarding the mother’s right to privacy and right to terminate her pregnancy. In addition, both approaches must fall within certain standards to avoid vagueness problems. First, the statutes must have a core meaning.²⁹² Thus, a ban on experimentation must set forth a clear standard alerting

²⁸⁷ *Id.* § 12](a)I.

²⁸⁸ *Id.*

²⁸⁹ See N.D. CENT. CODE § 14-02.2-01 (1997) (“A person may not use any live human fetus, whether before or after expulsion from its mother’s womb, for scientific, laboratory, research, or other kind of experimentation. This section does not prohibit procedures . . . [that] do not substantially jeopardize the life or health of the fetus”); R.I. GEN. LAWS § 11-54-1 (2000) (“No person shall use any live human fetus, whether before or after the expulsion from its mother’s womb, for scientific, laboratory research, or other kind of experimentation. This section does not prohibit procedures . . . [that] do not substantially jeopardize the life or health of the fetus”). North Dakota also provides that the statute “does not prohibit or regulate diagnostic or remedial procedures, the purpose of which is to determine the life or health of the fetus involved or to preserve the life or health of the fetus involved, or of the mother involved.” N.D. CENT. CODE § 14-02.2-01(3). The statute in Rhode Island provides the same exception. R.I. GEN. LAWS § 11-54-1(c).

²⁹⁰ See *infra* Part IV.

²⁹¹ Although there is currently no state statute identical to the model statutes presented, aspects of the model statutes are based on various current state statutes.

²⁹² *Lifchez v. Hartigan*, 735 F. Supp. 1361, 1372 (N.D. Ill. 1990).

people of common intelligence as to what conduct is unlawful.²⁹³ Second, the state must clearly define the terms used in the statutes.²⁹⁴ This includes providing examples of what experimentation is and is not allowed. Third, the statutes cannot cause a chilling effect.²⁹⁵ If the terms are not well defined, arbitrary enforcement may follow.²⁹⁶ Different officials will decide what experimentation is unlawful by using different standards. This arbitrary enforcement may lead a scientist or physician to simply stop experimenting for fear of possible prosecution under the statute. This type of chilling effect is constitutionally unacceptable.

The following is a model statute banning embryonic stem cell research:

§ 1. Public Policy

The policy of this State is to protect the life of every unborn child, from fertilization until birth, regardless of their degree of biological development, to the extent permitted by the federal Constitution.²⁹⁷ An embryo conceived through in vitro fertilization, though not yet implanted or born, is deemed an unborn child and existing legal person for purposes of this statute.²⁹⁸

§ 2. Embryonic Stem Cell Research Prohibited

(a) No embryo, or any unborn child, shall be used for purposes of embryonic stem cell research.

²⁹³ *Margaret S. v. Edwards*, 794 F.2d 994, 999 (5th Cir. 1986); *Lifchez*, 735 F. Supp. at 1376.

²⁹⁴ *Lifchez*, 735 F. Supp. at 1364.

²⁹⁵ *Jane L. v. Bangerter*, 61 F.3d 1493, 1502 (10th Cir. 1995); *Lifchez*, 735 F. Supp. at 1364.

²⁹⁶ Arbitrary enforcement includes the lack of enforcement.

²⁹⁷ KY. REV. STAT. ANN. § 311.710 (Banks-Baldwin 2002). Kentucky's General Assembly holds that if the United States Constitution is amended, or if the Supreme Court's abortion decisions are ever reversed, the State would "recognize and protect the lives of all human beings regardless of their degree of biological development." *Id.*

²⁹⁸ CAL. CIV. CODE § 43.1 (West 1982 & Supp. 2002) ("A child conceived, but not yet born, is deemed an existing person . . ."); 720 ILL. COMP. STAT. ANN. 510/1 (West 1993) (declaring Illinois' longstanding policy that "the unborn child is a human being from the time of conception and is, therefore, a legal person for purposes of the unborn child's right to life and is entitled to the right to life from conception under the laws and Constitution of this State").

(b) Definitions

1. "Embryo." An embryo is an unborn child created through the in vitro fertilization process.²⁹⁹
2. "Unborn child." An unborn child is a human life existing and developing from fertilization until birth.³⁰⁰
3. "Embryonic stem cell research." Embryonic stem cell research is the derivation of embryonic stem cells, obtained by destroying the outer shell of the embryo and removing the inner cell mass, thus destroying the embryo and the potential life of the embryo in the process.³⁰¹
4. "Embryonic stem cells." Embryonic stem cells are the building block cells that develop into the specialized cells and tissues of the human body.³⁰²

Commentary

The first, and perhaps most simple, manner of prohibiting stem cell research within a state is to have a statute focused solely on stem cell research itself. Because the egg is fertilized outside of the mother's body, such a statute would avoid many of the issues regarding the mother's rights.³⁰³ For example, stem cell research does not involve terminating

²⁹⁹ See *supra* notes 7-12 and accompanying text.

³⁰⁰ 720 ILL. COMP. STAT. ANN. 5/9-1.2 (West 1993 & Supp. 2002) (defining an unborn child as "any individual of the human species from fertilization until birth"); MASS. GEN. LAWS ANN. ch. 112, § 12K (West 1996) (stating that an unborn child is an "individual human life in existence and developing from fertilization until birth"); MO. REV. STAT. § 188.015 (West 1996) (defining unborn child as "the offspring of human beings from the moment of conception until birth and at every stage of its biological development, including the human conceptus, zygote, morula, blastocyst, embryo, and fetus"); MONT. CODE ANN. § 41-1-103 (2001) (providing that a child conceived, while not yet born, is an existing person); S.D. CODIFIED LAWS § 26-1-2 (Michie 1999) (stating that "[a] child conceived, but not born," is an existing person).

³⁰¹ THE HUMAN EMBRYONIC STEM CELL DEBATE, *supra* note 20, at xvii; Varmus, *supra* note 12, at 48; see also *supra* notes 19-22 and accompanying text.

³⁰² Lee, *supra* note 4, at 81; Quinn, *supra* note 17, at 851; Stolberg, *supra* note 17, at A1; see also McGinley, *supra* note 18, at A20 (terming embryonic stem cells as "primitive building-block cells").

³⁰³ Casey, *supra* note 6, at 151 n.8.

an unwanted “pregnancy.”³⁰⁴ Nor is there a question of the mother’s physical health as asserted in *Roe* and *Casey*. In addition, banning stem cell research does not force the mother into a “distressful life and future.”³⁰⁵ Even the NIH does not consider the mother’s privacy and right to terminate pregnancy in its Guidelines recommending stem cell research.³⁰⁶ In addition, by simply banning stem cell research, a state would avoid the issues involved in diagnostic procedures that may or may not preserve the life and health of the embryo. For example, the court’s concerns in *Lifchez* regarding chorionic villi sampling and embryo transfer are nonexistent when the embryo is in a frozen state outside of the mother’s womb.³⁰⁷ Banning stem cell research avoids the sticky process of differentiating what is and is not beneficial to the embryo.

The statute must still conform to vagueness standards. If the statute is narrowly drawn and only targets stem cell research, the state can explain what falls within the zone of such experimentation. Thus the statute should include the state’s definition of stem cell research. This would alert people “of common intelligence” as to what conduct is considered unlawful and deter a chilling effect among researchers in the field.³⁰⁸ However, because the statute is so narrowly drawn, states should consider the following model statute and expand the regulation in order to reach a broader range of embryonic experimentation:

§ 1. Public Policy

The policy of this State is to protect the life of every unborn child, from fertilization until birth, regardless of their degree of biological development, to the extent permitted by the federal Constitution.³⁰⁹ A human conceptus is deemed an unborn child and existing legal person for purposes of this statute.³¹⁰

³⁰⁴ TABER’S CYCLOPEDIA MEDICAL DICTIONARY, *supra* note 201, at 1730. As such, stem cell research does not fit within the pregnancy interests asserted in *Roe* and *Casey*. See *supra* notes 197-206 and accompanying text.

³⁰⁵ *Roe v. Wade*, 410 U.S. 113, 153 (1973).

³⁰⁶ See generally National Institutes of Health Guidelines for Research Using Human Pluripotent Stem Cells, 65 Fed. Reg. 51,976 (Aug. 25, 2000).

³⁰⁷ See *Lifchez v. Hartigan*, 735 F. Supp. 1361, 1367-68 (N.D. Ill. 1990).

³⁰⁸ *Lifchez*, 735 F. Supp. at 1376.

³⁰⁹ KY. REV. STAT. ANN. § 311.710 (Banks-Baldwin 2002).

³¹⁰ CAL. CIV. CODE § 43.1 (West 1982 & Supp. 2001); 720 ILL. COMP. STAT. ANN. 510/1 (West 1993).

§ 2. Destruction and Experimentation Prohibited; Exceptions

- (a) A living human conceptus is a juridical person and shall not be intentionally destroyed by any other person or through the actions of such a person.³¹¹
- (b) A living human conceptus shall not be used for research or experimentation that is not performed to protect the life or health of the particular embryo involved.³¹² Such research or experimentation includes:
 1. Nontherapeutic research or experimentation;³¹³
 2. Research or experimentation that will substantially jeopardize the life or health of the human conceptus;³¹⁴ and
 3. Other research or experimentation that includes:
 - a. Procedures where the subject used gains no direct benefit;³¹⁵ and
 - b. Procedures where the researcher uses the subject merely to increase his own knowledge or to increase the knowledge of his professional field.³¹⁶
- (c) Procedures that do not substantially jeopardize the life or health of the human conceptus are allowed.³¹⁷
 1. This section does not prohibit or regulate diagnostic, assessment, or treatment procedures, the purpose of which is to determine the life or status or improve the health of the living human conceptus.³¹⁸

³¹¹ LA. REV. STAT. ANN. § 9:121 (West 2000).

³¹² MINN. STAT. ANN. § 145.422 (West 1998).

³¹³ MICH. COMP. LAWS ANN. § 333.2685 (West 2001).

³¹⁴ *Id.*

³¹⁵ *Lifchez v. Hartigan*, 735 F. Supp. 1361, 1365 (N.D. Ill. 1990).

³¹⁶ *Id.*

³¹⁷ MASS. GEN. LAWS ANN. ch. 112, § 12J (West 1996).

³¹⁸ *Id.*; MICH. COMP. LAWS ANN. § 333.2686 (West 2001).

2. This section does not preclude the use of a living human conceptus for research or experimentation which verifiable scientific evidence has shown to be harmless to the conceptus.³¹⁹

(d) Definitions

1. "Human conceptus." A human conceptus is any human organism, conceived either in the human body or through the in vitro fertilization process, from fertilization until birth.³²⁰
2. "Destruction." Destruction of the human conceptus occurs when the conceptus is harmed to such a degree that it is no longer capable of maturing toward birth. If the leftover products of the human conceptus thrive, the conceptus is still deemed destroyed.
3. "Nontherapeutic research." Nontherapeutic research is any scientific or laboratory experimentation not designed to improve the health of the research subject directly involved.³²¹
4. "Living." A human conceptus is not living when it fails to develop over a thirty-six hour period.³²² A human conceptus created and frozen through cryopreservation is deemed living.³²³

Commentary

Constitutionally banning embryonic experimentation and not limiting the ban to stem cell research is a little more difficult, as is evidenced by the overturned statutes in Louisiana, Illinois, and Utah.³²⁴ The first step in promulgating such a statute is to avoid placing the state's interest in protecting potential life in competition with the mother's interest in privacy and in terminating her pregnancy. One

³¹⁹ MINN. STAT. ANN. § 145.422 (West 1998).

³²⁰ *Id.* § 145.421.

³²¹ MICH. COMP. LAWS ANN. § 333.2692 (West 2001); 18 PA. CONS. STAT. ANN. § 3216 (West 2000).

³²² LA. REV. STAT. ANN. § 9:121 (West 2000).

³²³ *Id.*

³²⁴ *See supra* Part II.D.

approach is to clearly define which embryos the statute is regulating. For example, the state could limit the ban to the use of frozen embryos created through the IVF process for implantation. However, narrowing the statute to such a degree substantially limits the state from regulating other types of unwanted research. Indeed, when limited to IVF embryos, the statute would read much like a ban solely on stem cell research. Thus, a better approach is to ban experimentation but provide exceptions. These exceptions include diagnostic procedures used to determine or preserve the life of the embryo and procedures that do not jeopardize the life of the embryo. The state may also ban nontherapeutic experimentation and provide a definition for determining what is and what is not “nontherapeutic.”

The state must clearly define the terms it uses in banning embryonic research. A definition of “experimentation” must be provided, along with the explanations of the exceptions already mentioned.³²⁵ For example, the prohibited experimentation would include research where the embryo gains no direct benefit, but rather the researcher is simply increasing personal knowledge. The definition should also include instances where the researcher uses the embryo simply to gain information to use in another procedure. On the other hand, “experimentation” should not include procedures that merely have not yet been used exhaustively so as to warrant the terminology “test.” Another term that is necessary to define is “destruction.” This is needed to deter any arguments that stem cell research is not “destructive” because the stem cell continues to grow. Such measures will better enable states to promulgate constitutional statutes banning embryonic research.

V. CONCLUSION

The issues surrounding the stem cell debate are numerous and complex. This Note examines one specific area of the controversy: the constitutionality of the current state bans on embryonic research. While Supreme Court abortion decisions balance the mother’s right to privacy against the state’s interest in potential life, the mother’s interest has

³²⁵ Arguably, the word “experimentation” is a term of art and should alert scientists as to what a statute is prohibiting. See *supra* note 235. However, because of the holdings in *Lifchez, Jane L.*, and *Margaret S.*, it is best to include definitions in order to memorialize a state’s intentions and to clear up any ambiguities a court may perceive. An alternative is to reference within the statute that the state is using the definitions as laid out in the Belmont Report of the Office for Protection from Research Risks. See *supra* note 235.

never been used to strike down a ban on embryonic research. Instead, the courts have focused solely on vagueness. In order to pass constitutional muster, a statute must meet three standards to avoid being struck down as vague. First, the statute must have a core meaning. It cannot be standardless, but must inform people of common intelligence what actions are prohibited. Second, the statute must contain definite terms to ensure that enforcement will not be arbitrary or capricious. Third, the statute cannot produce a chilling effect caused by undefined terms and the possibility of arbitrary enforcement. With these standards in mind, this Note proposes two model statutes. The first focuses exclusively on banning stem cell research, while the second prohibits a broader range of embryonic experimentation. Recognizing the need to promulgate statutes according to the vagueness standards and examining the model statutes set forth in this Note will assist states in creating constitutional laws focused on protecting their interest in human life.

Mailee R. Harris*

* Special thanks to Timothy and Tearyl Harris, Jarrett Harris, and my fiance Kurt Smith for loving and praying me through this process, to Dr. Nathan Adams and Dr. Samuel Casey for their help and support, and most especially to the One for Whom this is written.

