
LEGAL UPDATE

GENETIC TRANSPLANTATION CLONING AND FEDERAL LEGISLATION: SOME CONSTITUTIONAL ISSUES

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I. INTRODUCTION

In February 1997, news broke that scientists had successfully cloned a sheep named Dolly from another adult sheep. The release of this information caused a public outcry throughout the United States over the potential cloning of humans.¹ In response, former President Clinton took three actions. First, he issued a national directive banning the use of federal funds for any human cloning research.² Next, the President requested that the private sector voluntarily refrain from experimentation with the purpose of creating a human clone.³ Finally, he asked the National Bioethics Advisory Commission (NBAC)⁴ to report its advice on human cloning within ninety days.⁵ After receiving the NBAC's report, President Clinton sent Congress the Cloning Prohibition Act of 1997.⁶ Congress, within two weeks of the announcement of

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¹ See Anne Lawton, *The Frankenstein Controversy: The Constitutionality of a Federal Ban on Cloning*, 87 KY. L.J. 277, 279 (1999).

² See Memorandum on the Prohibition on Federal Funding for Cloning of Human Beings, 33 WEEKLY COMP. PRES. DOC. 281 (Mar. 4, 1997) [hereinafter Federal Funding Prohibition].

³ See Susan Greenle, *Dolly's Legacy to Human Cloning: International Legal Responses and Potential Human Rights Violations*, 18 WIS. INT'L L.J. 537, 540 (2000).

⁴ President Clinton originally created the National Bioethics Advisory Commission ("NBAC") in the fall of 1995 to advise government agencies about "bioethical issues arising from research on human biology and behavior," as well as "applications, including the clinical applications, of research." Exec. Order No. 12,975 §4(a)(1), 2, 60 Fed. Reg. 52,063 (1995), reprinted in 42 U.S.C. § 6601 (1998).

⁵ See NATIONAL BIOETHICS ADVISORY COMM'N, CLONING HUMAN BEINGS: REPORT AND RECOMMENDATIONS OF THE NATIONAL BIOETHICS ADVISORY COMM'N, LETTER FROM THE PRESIDENT (1997), available at <<http://bioethics.gov/pubs/cloning1/cloning.pdf>> [hereinafter CLONING HUMAN BEINGS].

⁶ See CLONING PROHIBITION ACT OF 1997, H.R. DOC. NO. 105-97 (1997); CLONING

Dolly's existence, also responded.⁷ Senator Bond of Missouri and Representative Ehlers of Michigan introduced anti-cloning bills in the Senate and House, respectively.⁸ In sum, nine anti-cloning bills have been proposed.⁹ In spite of this flurry of proposals, Congress has failed to enact any anti-cloning legislation.¹⁰ This legal update examines cloning and previously proposed federal anti-cloning legislation.

II. CLONING

Cloning involves the removal of genetic material from one entity to create another.¹¹ Unlike sexual reproduction, it involves the genetic material from only one entity and therefore produces an identical genetic copy of the original.¹² Notwithstanding recent public fervor, cell cloning has been occurring for decades.¹³ Yet only recently have certain processes of cloning raised the legal and ethical concerns now being addressed.¹⁴ Currently, there are four different methods employed with mammalian cloning: (1) molecular or gene cloning; (2) cellular cloning; (3) blastomere separation, also known as embryo splitting; and (4) nuclear transplantation cloning.¹⁵ The latter two may be used to create adult human clones and, therefore, raise concerns over cloning.¹⁶

Molecular cloning involves replicating sections of DNA known as genes.¹⁷ This replication of DNA is significant for cloning because DNA is the template that encodes the chemicals needed for life function by the organism.¹⁸ The

PROHIBITION ACT OF 1997—MESSAGE FROM THE PRESIDENT OF THE UNITED STATES, 143 CONG. REC. H3638 (daily ed. June 10, 1997) (statement by the Speaker pro tempore reading the message from the President).

⁷ See Lawton, *supra* note 1, at 304.

⁸ See *id.*

⁹ See *id.*

¹⁰ See *id.*

¹¹ See Nancy Gibbs, *Baby, It's You! And You, And You . . .*, TIME, Feb. 19, 2001, at 52-53.

¹² See *id.*

¹³ See *id.* at 281.

¹⁴ See *id.* at 284.

¹⁵ See *id.*

¹⁶ See *id.*

¹⁷ See *id.* at 284-85.

¹⁸ Every cell has genetic material called DNA. See *DNA*, ENCYCLOPEDIA BRITANNICA, available at <<http://www.britannica.com/eb/article?eu=31232&tocid=0>>. DNA is the template that encodes for RNA. See *RNA*, ENCYCLOPEDIA BRITANNICA, available at <<http://www.britannica.com/eb/article?eu=65467&tocid=0>>. RNA encodes for proteins needed both for functioning of the individual cell as well as the entire organism. See *Protein*, ENCYCLOPEDIA BRITANNICA, available at <<http://www.britannica.com/eb/article?eu=63159&tocid=0>>.

production of insulin for diabetes via molecular cloning is an example of the benefits of this type of cloning.¹⁹ Cell cloning entails duplication of somatic cells.²⁰ Cloning of these cells allows scientists to test the impact of medicines on these cells before testing drugs on actual human subjects.²¹

Blastomere separation, also known as embryo splitting, differs from other cloning processes because its general purpose is to produce a live animal clone.²² Further, this kind of cloning occurs naturally in the process that results in identical twins.²³ Blastomere separation first requires the fertilization of an egg by a sperm.²⁴ The fertilized egg then begins to divide and becomes two cells, then four cells, and so on.²⁵ A blastomere is any one of these divided cells.²⁶ These cells are totipotent, meaning they possess the potential to become an entire new organism.²⁷ Separation of an individual blastomere at this stage from the remaining cells would allow this blastomere to form an identical genetic organism.²⁸ Scientists have been successful in creating adult animal clones from a single animal embryo.²⁹ Additionally, scientists have created the first human embryonic clones but have not allowed development of these to go beyond six days.³⁰

Somatic cell nuclear transplantation cloning was the process used in the creation of Dolly and is also what caused the public outcry for a ban on cloning.³¹ In somatic cell nuclear transplantation cloning, genetic material is removed from a somatic cell of one organism and transferred into an egg of another from which the nucleus, which contains the egg's genetic material, has been removed.³² The organism thus develops solely from the genetic material of the somatic cell donor and is identical to that organism.³³ Either embryonic cells or fully differentiated adult or somatic cells may be used as the source of

¹⁹ See *supra* note 1, at 285 (stating that insulin regulates the metabolism of sugar and that diabetics cannot produce the substance in sufficient quantity to carry out such metabolism).

²⁰ See *id.* at 286. A somatic cell is one other than the reproductive or germ cells. See *Soma*, ENCYCLOPEDIA BRITANNICA, available at <<http://www.britannica.com/search?miid=1244041&query=somatic+cell>>.

²¹ See *supra* note 1, at 286.

²² See *id.* at 287.

²³ See *id.*

²⁴ See *id.*

²⁵ See CLONING HUMAN BEINGS, *supra* note 5, app. at 1.

²⁶ See *id.*

²⁷ See *id.* at 15.

²⁸ See *id.*

²⁹ See *id.*

³⁰ See *id.* at 288.

³¹ See Greenlee, *supra* note 3, at 538. See generally Gibbs, *supra* note 11.

³² See Gibbs, *supra* note 11, at 52-53.

³³ See *id.*

the genetic material in nuclear transplantation cloning.³⁴ In Dolly's case a somatic cell was taken from a mammary gland of an adult sheep.³⁵ The mammary gland cell was then starved to make it totipotent.³⁶ Next, it was implanted in a denucleated sheep egg cell.³⁷ Of 277 attempts at this stage, twenty-nine developed into sheep embryos.³⁸ These twenty-nine embryos were implanted into a surrogate sheep mothers, and out of these twenty-nine embryo implantations, one was successful gestated and born.³⁹

There are many potential benefits of cloning.⁴⁰ For instance, the cloning process can be used to create a herd of beneficial transgenic animals.⁴¹ These animals could help provide proteins that would be invaluable in treating diseases.⁴² For example, through genetic engineering, a cow could be created that produced proteins lacking in hemophiliacs.⁴³ Ingestion of the milk of this cow could provide an individual with necessary clotting factors to contribute to leading a normal life.⁴⁴ Though genetic engineering would allow for the creation of this transgenic animal it would not be possible to mass produce this animal without a cloning process.⁴⁵

Another benefit of cloning research might be a better understanding and potential treatment of genetic diseases, cancer, and neurological traumas.⁴⁶ Specifically, nuclear transplantation provides scientists a way to learn how to make somatic cells revert to their most primitive totipotent state.⁴⁷ This allows scientists to "learn how to direct, or grow, these cells in the manner they wish, ultimately leading to control of the development of normal and abnormal cells."⁴⁸ Therefore, cloning technology could allow scientists to better understand why cancerous cells mutate and divide out of control.⁴⁹

³⁴ See Lawton, *supra* note 1, at 288.

³⁵ See *id.*

³⁶ See S. Begley, *Little Lamb, Who Made Thee?*, NEWSWEEK, March 10, 1997, 53-57. When a cell is totipotent, it is then able to develop into a complete organism. See Lawton, *supra* note 27, at 15.

³⁷ See *id.* at 288.

³⁸ See *id.*

³⁹ See *id.* at 288-289.

⁴⁰ E. Donald Shapiro, et al., *Legislation Morality: The Debate Over Human Cloning- To Clone or Not to Clone*, 4 NYU J. LEGIS. & PUB. POL'Y 23, 30 (2000).

⁴¹ See Lori B. Andrews, *Cloning Human Beings: The Current and Future Legal Status of Cloning F-9* (1997), available at <<http://bioethics.gov/pubs/cloning2/cc6.pdf>>.

⁴² See *id.*; See Shapiro, et al., *supra* note 40, at 30.

⁴³ See Andrews, *supra* note 41, at F-9.

⁴⁴ See *id.*

⁴⁵ See *id.*

⁴⁶ See *id.* at F-10.

⁴⁷ See *id.*

⁴⁸ See *id.*

⁴⁹ See *id.*

Additionally, this technology may also allow scientists to take differentiated cells from one part of the body and change them into other types of cells for use in other parts of the body, which could help treat previously untreatable conditions such as Parkinson's Disease or cystic fibrosis.⁵⁰ This development could also help researchers better understand why some tissues, such as that of spinal cord, brain, and heart, do not regenerate post trauma.⁵¹

Human cloning research could also be invaluable in organ transplantation.⁵² The research might provide insights into methods of growing skin for burn victims and persons with other skin-related diseases.⁵³ Further, it may provide methods of growing organs in vitro or in animals that would not be rejected by the recipients.⁵⁴ Human cloning could also allow people who suffer from ailments that would require cell donation to donate cells to themselves.⁵⁵

Finally, cloning research may help in the reproduction realm.⁵⁶ First, it may help to better understand the mechanisms of human reproduction.⁵⁷ For example, it may lead to understanding why high rate of spontaneous abortions occur.⁵⁸ Additionally, it may become a noncoital form of reproduction that may be used where other noncoital forms such as "in vitro fertilization, egg donation, embryo donation, and surrogate motherhood" fail.⁵⁹

III. PROPOSED CLONING REGULATIONS AND LEGISLATION.

After the public release of the successful cloning of Dolly through nuclear transplantation, the President issued a directive to all executive departments and agencies prohibiting the use of federal funds to clone human beings.⁶⁰ Further, he requested that the head of the National Bioethics Advisory Commission ("NBAC") examine the implications of Dolly's birth.⁶¹ On June 9, 1997, the NBAC's report, *Cloning Human Beings*, was presented to the President.⁶² The report recommended adoption of federal legislation, subject to expiration, that banned the use of somatic cell nuclear transfer cloning to create children.⁶³ It found that serious questions about the use of somatic cell

⁵⁰ See *id.*

⁵¹ See *id.*

⁵² See *id.* at F-12.

⁵³ See *id.*

⁵⁴ See *id.*; Shapiro, et al., *supra* note 40, at 30.

⁵⁵ See Shapiro, et al., *supra* note 40, at 30.

⁵⁶ See *id.*; Andrews, *supra* note 41 at F-10.

⁵⁷ See Andrews, *supra* note 41, at F-10.

⁵⁸ See *id.* at F-10 to F-11.

⁵⁹ See *id.*; See Shapiro, et al., *supra* note 40, at 30.

⁶⁰ See Federal Funding Prohibition, *supra* note 2.

⁶¹ See *id.*

⁶² See CLONING HUMAN BEINGS, *supra* note 5.

⁶³ See *id.* at 109.

nuclear transfer to clone a child justified a limited ban on the technology.⁶⁴ The NBAC believed that a permanent ban might unnecessarily infringe on an individual's right to make decisions about procreation.⁶⁵ Additionally, the NBAC advised that legislation should be carefully drafted in order to prevent limitations on scientific research unrelated to cloning individuals.⁶⁶ Based upon the recommendation of NBAC, President Clinton sent draft legislation to Congress in the form of the Cloning Prohibition Act of 1997 (the "CPA").⁶⁷ The CPA would prohibit the use of the somatic cell nuclear transfer process "with the intent of introducing the product of that transfer in a woman's womb or in any other way creating a human being."⁶⁸ Though many of the ethical and legal issues raised to justify banning nuclear transplantation cloning were present in blastomere separation, both the NBAC's report and the CPA failed to address blastomere separation as a form of prohibited cloning activity.⁶⁹

Congress also commenced hearings concerning cloning legislation immediately following the news of Dolly's birth.⁷⁰ Senator Christopher Bond of Missouri introduced the first piece of cloning legislation (the "Bond Act").⁷¹ The Bond Act proposed to ban the use of federal funds "for research with respect to cloning a human individual."⁷² It defined cloning as "the replication of a human individual by the taking of a cell with genetic material and the cultivation of the cell through the egg, embryo, fetal, and newborn stages into a new human individual."⁷³ Though Senator Bond had criticized the NBAC for not calling for a ban on the cloning of human embryos, the Bond Act failed to do so as well.⁷⁴ By banning cloning only of a human individual, the Bond Act failed to encompass embryos, which are not human individuals since current law defines human individuals as those who have been born.⁷⁵ In essence, the Bond Act only duplicated the President's executive order.

On February 3, 1998 Senator Bond and Senate Majority Leader Trent Lott introduced identical pieces of anti-cloning legislation.⁷⁶ This legislation,

⁶⁴ See *id.* at 107.

⁶⁵ See *id.* at 107, 109.

⁶⁶ See *id.* at 109.

⁶⁷ See CLONING PROHIBITION ACT OF 1997, H.R. DOC. NO. 105-97 (1997); CLONING PROHIBITION ACT OF 1997 (H.R. DOC. NO. 105-97)—MESSAGE FROM THE PRESIDENT OF THE UNITED STATES, 143 CONG. REC. H3638 (daily ed. June 10, 1997) (statement by the Speaker pro tempore).

⁶⁸ See H.R. DOC. NO. 105-97 § 5, at 7.

⁶⁹ See Lawton, *supra* note 1, at 303.

⁷⁰ See *id.* at 304.

⁷¹ See *id.* at 305; S. 368, 105th Cong. (1997).

⁷² S. 368, 105th Cong. § 1(a).

⁷³ *Id.*

⁷⁴ See Lawton, *supra* note 1, at 306.

⁷⁵ See *id.* at 305-306.

⁷⁶ See *id.* at 309.

known as the Human Cloning Prohibition Act (the “Bond/Lott Act”), imposed criminal and civil penalties for any use of “human somatic cell nuclear transfer technology” in or affecting interstate commerce.⁷⁷ It defined “human somatic cell nuclear transfer technology” as “taking the nuclear material of a human somatic cell and incorporating it into an [egg] from which the nucleus has been removed . . . and producing an embryo.”⁷⁸ Though it failed to address blastomere splitting, the bill would have made any human nuclear transfer that would produce an embryo illegal and thus limited legitimate scientific research.⁷⁹ Additionally, this legislation had no expiration date making future review of the ban less likely.⁸⁰ The Bond/Lott Act came up for debate on the Senate floor, but it was not voted upon due to a filibuster by Senators Kennedy and Feinstein.⁸¹ The Bond/Lott act failed to obtain the sixty votes need to the end the filibuster because many senators expressed concerns that the Act would unjustifiably impede scientific research.⁸²

In response to the Bond/Lott Act, Senators Feinstein and Kennedy introduced the Prohibition on Cloning of Human Beings Act of 1998 (the “Feinstein/Kennedy Act”).⁸³ The Feinstein/Kennedy Act would levy stiff fines for any attempt to implant an embryo created by nuclear transplantation cloning.⁸⁴ It differed from the Bond/Lott Act by only prohibiting the implantation of nuclear transplanted embryos.⁸⁵ Additionally, unlike the Bond/Lott Act, the Feinstein/Kennedy Act would expire after ten years.⁸⁶ Therefore, the language of the Feinstein/Kennedy Act would allow research on both human embryonic and adult cells using somatic cell nuclear transfer technology as long as no implantation took place.⁸⁷ Similar to the previous proposed legislation, the Feinstein/Kennedy Act did not address the issue of embryo splitting research for the creation of a human clone.⁸⁸

The proposed legislation suggests there are two camps concerning the scope of federal anti-cloning legislation.⁸⁹ One conservative group clearly opposes

⁷⁷ Human Cloning Prohibition Act, S. 1601, 105th Cong. (1998).

⁷⁸ *Id.* at § 3(a).

⁷⁹ See Lawton, *supra* note 1, at 310.

⁸⁰ See *id.* at 311.

⁸¹ See *id.* at 310.

⁸² See *id.*

⁸³ See *id.*; S. 1602, 105th Cong. (1998). After reference with the Senate’s Committee on Labor and Human Resources, a practically identical version of the bill was introduced and placed on the Senate’s calendar on February 5, 1998. See Lawton, *supra* note 1, at 310 n.187; Prohibition on Cloning of Human Beings Act of 1998, S. 1611, 105th Cong. (1998).

⁸⁴ See S. 1611, § 4.

⁸⁵ Compare S. 1611, § 4, with S. 1601, § 3.

⁸⁶ See S. 1611, § 4.

⁸⁷ See Lawton, *supra* note 1, at 311.

⁸⁸ See *id.*

⁸⁹ See *id.* at 304.

embryo research, believing that embryos should be treated as human life and that experimenting with human embryos violates fundamental social morals.⁹⁰ This is the same group that wishes to classify embryos as human beings in the abortion debate.⁹¹ As a result of these beliefs, this faction opposes any form of human cloning, whether it involves only pure research or actual efforts to create a human clone.⁹² The other group of legislators are concerned with fostering scientific research while preventing the end result of creating a human clone.⁹³

A threshold consideration for any anti-cloning legislation is its constitutionality.⁹⁴ If federal anti-cloning legislation is enacted there are at least three constitutional grounds for challenging it: (1) that it is not within the scope of the commerce clause; (2) that it violates scientists' First Amendment prerogatives over freedom of inquiry; and (3) that it violates a couple's or individual's constitutional right of privacy or liberty in making reproductive decisions.⁹⁵

The Supreme Court has held recently that there are limits to Congressional regulation under the Commerce Clause.⁹⁶ However, the facts of that case are distinguishable from the case of cloning since much of the equipment or materials, funding, and personnel required for cloning, as well as the individuals seeking cloning services, would likely have traveled in interstate commerce.⁹⁷ Congress could bolster the constitutionality of legislation by addressing the commerce clause concerns in the legislative findings as it did in the Feinstein/Kennedy Act.⁹⁸ The likelihood that anti-cloning legislation would be held unconstitutional on this ground is small.

Some scholars believe there might be a right of scientific inquiry protected by the right to free speech under the First Amendment.⁹⁹ Though the Supreme Court has not directly ruled on the right to scientific inquiry,¹⁰⁰ a lower federal court has suggested in dicta that scientists do have a right to conduct research.¹⁰¹ However, other federal courts have failed to recognize a First

⁹⁰ *See id.*

⁹¹ *See id.*

⁹² *See id.* at 305.

⁹³ *See id.*

⁹⁴ *See Andrews, supra* note 41, at F-5.

⁹⁵ *See id.*

⁹⁶ *See id.*; *United States v. Lopez*, 514 U.S. 549, 561 (1994) (finding a Congressional Act passed under the Commerce Clause prohibiting possession of a handgun within 1,000 feet of a school was in fact a criminal statute unrelated to the regulation of interstate commerce).

⁹⁷ *See Andrews, supra* note 41, at F-5.

⁹⁸ *See id.*; S. 1602, 105th Cong. § 2 (1998).

⁹⁹ *See Andrews, supra* note 41, at F-6.

¹⁰⁰ *See id.*

¹⁰¹ *See Henley v. Wise*, 303 F. Supp 62, 66 (N.D. Ind. 1969) (finding a "right of scholars to do research and advance . . . man's knowledge" is constitutionally protected.)

Amendment right to scientific inquiry.¹⁰²

The right to make decisions about whether to bear children is a fundamental liberty that is constitutionally protected.¹⁰³ A lower federal court has ruled that the right to make procreative decisions includes medically assisted reproduction, such as in vitro fertilization and the use of donated embryos.¹⁰⁴ Some scholars have suggested this right of reproductive choice includes cloning.¹⁰⁵

Though Congress has failed to pass federal legislation, certain states have enacted laws dealing with the human cloning issue.¹⁰⁶ For example, California in 1998 banned human cloning for a period of five years.¹⁰⁷ Action by individual states seems to be the current approach to address cloning issues. Anti-cloning legislation threatens to create problems analogous to those raised in the abortion debate and severely limit scientific research. If federal legislation were enacted scientific research could be broadly hindered even without real attempts at creating human clones being made. Challenges to state anti-cloning laws will allow for their constitutionality to be tested on both the First Amendment and reproductive liberty without testing such legislation's

¹⁰² See Andrews, *supra* note 41, at F-6 (citing *Margaret S. v. Edwards*, 488 F. Supp. 181, 220-21 (E.D. La. 1990); *Margaret S. v. Treen*, 597 F. Supp. 636 (E.D. La. 1984), *aff'd sub. nom.*, *Margaret S. v. Edwards*, 794 F.2d 994 (5th Cir. 1986); *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)).

¹⁰³ See *Planned Parenthood v. Casey*, 505 U.S. 833, 846-53 (1992) (stating that procreation decisions are a liberty protected by the Fourteenth Amendment); *Eisenstadt v. Baird*, 405 U.S. 438, 452-55 (1972) ("If the right to privacy means anything, it is the right of the *individual*, married or single, to be free from unwarranted governmental intrusion into matters so fundamentally affecting a person as the decision to bear or beget a child."); *Griswold v. Connecticut*, 381 U.S. 479, 485-86 (1965) (finding that decisions regarding procreation within the marriage relationship fall within the zone of privacy created by several constitutional guarantees).

¹⁰⁴ See Andrews, *supra* note 41, at F-6 (citing *Lifchez v. Hartigan*, 735 F.Supp 1361, 1377 (N.D. Ill. 1990) (finding embryo transfer is within the cluster of constitutionally protected choices related to procreation), *aff'd without opinion, sub. nom.*, *Scholberg v. Lifchez*, 914 F.2d 260 (7th Cir. 1990), *cert. denied*, 498 U.S. 1069 (1991)).

¹⁰⁵ See Andrews, *supra* note 41, at F-6 (citing John A. Robertson, testimony before the National Bioethics Advisory Commission 82-83 (March 14, 1997), *available at* <<http://bioethics.gov/transcripts/index.html#mar97>>). In his testimony Robertson qualifies his statement that cloning should be permissible for reproductive purposes by limiting it to situations in which the intent is to produce a child to be raised by the couple. Cf. JOHN A. ROBERTSON, *CHILDREN OF CHOICE: FREEDOM AND THE NEW REPRODUCTIVE TECHNOLOGIES* 39-41, 169-70 (1994) (arguing that cloning might be a protected liberty to the extent that it is not used to enhance or diminish offspring but rather only as a form of reproductive choice, but acknowledging that even in that limited circumstance cloning may fall outside the bounds of protected liberty).

¹⁰⁶ See Lawton, *supra* note 1, at 313 (noting that California, Michigan, Rhode Island, and Missouri have enacted anti-cloning legislation).

¹⁰⁷ See CAL. HEALTH & SAFETY CODE § 24185 (West. Supp. 1998).

propriety as a matter of federal concern under the Commerce Clause. As scholars agree that federal anti-cloning legislation would pass muster under Commerce Clause analysis,¹⁰⁸ the absence of such federal legislation will allow for state courts to answer thornier constitutional questions regarding the legal status of cloning and provide insight before any sweeping federal measure is taken.

¹⁰⁸ See Lawton, *supra* note 1, at 321-32; Andrews, *supra* note 41, at F-5.