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# CRS Report for Congress

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## **Stem Cell Research: State Initiatives**

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# Stem Cell Research: State Initiatives

## Summary

Embryonic stem cells have the ability to develop into virtually any cell in the body. Stem cells are used by scientists to study the growth and differentiation of individual cells into tissues. This work may provide insights into the causes of birth defects, genetic abnormalities, and other disease states, as well as potential treatments. The research is controversial, in the opinion of some, because the stem cells are located within the embryo and the process of removing them destroys the embryo. Some have argued that stem cell research should be limited to adult stem cells obtained from tissues such as bone marrow or umbilical cord blood because they believe the derivation of stem cells from embryos is ethically unacceptable. Other scientists believe that adult stem cells should not be the sole target of research because of important scientific and technical limitations.

Due to the controversy, federal policy has limited federal funding for research on embryonic stem cells. In response, many states are moving forward with their own initiatives to encourage or provide funding for stem cell research in order to remain competitive and prevent the relocation of scientists and biotechnology firms to other states or overseas. However, without the central direction and coordinated research approach that the federal government can provide, many are concerned that the states' actions will result in duplication of research efforts among the states, a possible lack of oversight for ethical concerns, and ultimately a loss of U.S. preeminence in this important area of basic research. This report will be updated periodically.

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# Stem Cell Research: State Initiatives

Embryonic stem cells have the ability to develop into virtually any cell in the body. Scientists are using stem cells to study the growth and differentiation of individual cells into tissues.<sup>1</sup> Understanding these processes could provide insights into the causes of birth defects, genetic abnormalities, and other disease states. Stem cells may eventually be used to produce large amounts of one cell type to test new drugs for effectiveness and chemicals for toxicity, or they may be transplanted into a patient to treat medical conditions such as diabetes and Parkinson's disease.

Despite its promise, only a relatively small amount of federal funding has been used to support embryonic stem cell research. The research is controversial, in the opinion of some, because stem cells are located within the embryo and the process of removing them destroys the embryo.<sup>2</sup> Moreover, some of the research may involve a type of cloning (see the discussion of somatic cell nuclear transfer, or SCNT, below). Many abortion opponents and others opposed to embryonic stem cell research believe that cloning creates a human life, even though it may consist of only one or a few hundred cells, and that the destruction of a cloned embryo to extract stem cells is also ethically unacceptable.

Federal funding for embryonic stem cell research is limited by two factors. First, the Dickey amendment, which has been added to the Labor-Health and Human Services-Education appropriations bill each fiscal year, starting with FY1997. It prohibits using federal funds for the creation of human embryos for research purposes or for research in which human embryos are destroyed. Second, although the August 2001 Bush Administration stem cell policy for the first time allowed federal funds to be used for research on human embryonic stem cells, the Bush policy also limited federal research to only the 22 stem cell lines that were in existence in August 2001.

Scientists are concerned about the quality and longevity of these 22 stem cell lines. For a variety of reasons, many believe that research advancement requires the development of new embryonic stem cell lines, and for certain applications, stem cells derived from cloned embryos may offer the best hope for understanding and treating disease. Cloned embryos are created through a process called somatic cell nuclear transfer (SCNT).<sup>3</sup> In SCNT, the nucleus of an egg is removed and replaced by the nucleus from a mature body cell, such as a skin cell, obtained from a patient.

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<sup>1</sup> For further information, see CRS Report RL33540, *Stem Cell Research: Federal Research Funding and Oversight*, by Judith A. Johnson and Erin D. Williams.

<sup>2</sup> For further information, see CRS Report RL33554, *Stem Cell Research: Ethical Issues*, by Judith A. Johnson and Erin D. Williams.

<sup>3</sup> For further information, see CRS Report RL31358, *Human Cloning*, by Judith A. Johnson and Erin D. Williams.

In 1996, scientists in Scotland used the SCNT procedure to produce Dolly the sheep, the first mammalian clone. When SCNT is used to create another individual, such as Dolly, the process is called reproductive cloning. In contrast, scientists interested in using SCNT to create cloned stem cells allow the cell created via SCNT to develop for a few days before the stem cells are removed for research. Stem cells created via SCNT would be genetically identical to the patient, and thus would avoid any tissue rejection problems that could occur if the cells were transplanted into the patient. This is why the SCNT process is often called therapeutic cloning.

Regardless of federal policy, many states are moving forward with their own initiatives to encourage or provide funding for stem cell research (in some cases, therapeutic cloning as well) in order to remain competitive and prevent the relocation of scientists and biotechnology firms to other states or overseas. However, without the central direction and coordinated research approach that the federal government can provide, many are concerned that the states' actions will result in duplication of research effort among the states, a possible lack of oversight for ethical concerns, and ultimately a loss of U.S. preeminence in this important area of basic research.

**California.** In September 2002, California enacted the nation's first law that expressly permits and encourages research involving the derivation of human embryonic stem cells and cloned human embryos (California Health and Safety Code § 123440, 24185, 12115-7, 125300-320). The law does not authorize practices that were previously proscribed, but instead provides assurances to researchers and sponsors hesitant to invest in embryonic stem cell research since the 2001 Bush policy took effect. The law has reportedly enticed several prominent researchers to move to California from other states.

In November 2004, with the endorsement of Governor Arnold Schwarzenegger, Californians passed Proposition 71 with 59% of the vote, amending the state constitution to facilitate embryonic stem cell research. Proposition 71 established a California Institute for Regenerative Medicine (CIRM), and authorized a bond sale to generate \$3 billion for embryonic stem cell research over the next 10 years. Ninety percent of the funds will be spent on research; 10% will go toward facilities. All grants will be limited to scientists and facilities in California. Funds may not be used for reproductive cloning but may be used for therapeutic cloning.<sup>4</sup> In early May 2005, the 29-member governing board of CIRM, the Independent Citizens Oversight Committee (ICOC), announced that CIRM would be located in San Francisco.

However, CIRM is facing legislative and legal challenges that are holding up the bond sale. A state Senate bill sponsored by Deborah Ortiz would put an initiative on the November ballot that requires CIRM to conduct more open meetings and requires that a minimum royalty be returned to the state.<sup>5</sup> Lawsuits were filed in April 2005 by various groups — one claims that individuals on the ICOC have conflicts of interest that impede the ICOC's ability to fairly allocate money; a second charges that CIRM violates the state constitution because it lacks proper state

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<sup>4</sup> *Proposition 71*, at [<http://www.voterguide.ss.ca.gov/propositions/prop71text.pdf>].

<sup>5</sup> Laura Mecoy, "Stem Cell Bill Divides Ortiz, Official," *The Sacramento Bee*, Apr. 20, 2006, p. A3.

oversight; and a third claims that the CIRM program violates the rights of human embryos.<sup>6</sup> The first two lawsuits were consolidated, and the trial concluded in early March 2006. On April 21, 2006, the state judge ruled that the two lawsuits had no merit. An appeal of the ruling is expected, and will probably delay resolution into next year.<sup>7</sup> CIRM is funded until the end of June 2006 by a \$3 million state loan and a \$5 million grant from the Dolby Foundation.<sup>8</sup> In April 2006, the state authorized the sale of \$14 million in bond anticipation notes to six philanthropic foundations, the first of a total of \$50 million of such notes. The money will be used to fund the program until the lawsuits are resolved.

**Connecticut.** In January 2005, Connecticut Governor M. Jodi Rell proposed to use \$20 million of the \$315 million state budget surplus for human embryonic stem cell research.<sup>9</sup> Both Yale University and the University of Connecticut at Storrs have labs engaged in stem cell research. In March 2005, the Storrs lab announced that, in collaboration with Chinese scientists, it had become the first to create embryonic stem cells from cloned cattle embryos.<sup>10</sup> The Storrs lab wants to begin a human therapeutic cloning program. Lab chief Xiangzhong “Jerry” Yang threatened to leave for China if state funding was not provided. On June 15, 2005, Governor Rell signed legislation providing \$100 million over 10 years for human embryonic stem cell research.<sup>11</sup> On May 9, 2006, the Connecticut Stem Cell Research Advisory Committee approved guidelines for scientists who apply for research grants from the \$100 million state fund; grants will be awarded as early as September 2006.<sup>12</sup>

**Florida.** An amendment to the Florida constitution that would provide \$20 million per year for 10 years for embryonic stem cell research has been submitted to the state Division of Elections for approval as a ballot initiative. The initiative, sponsored by the Palm Beach County group Floridians for Stem Cell Research and Cures, also needs the approval of the Florida Supreme Court. Supporters are currently collecting signatures for the initiative to appear on the 2008 ballot.<sup>13</sup>

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<sup>6</sup> Steve Johnson, “Lawsuits Will Delay Stem-Cell Research,” *The Mercury News*, Aug. 2, 2005, p. 1.

<sup>7</sup> Lee Romney, “Judge Upholds Stem Cell Initiative,” *The Los Angeles Times*, Apr. 22, 2006, p. B1.

<sup>8</sup> Andrew Pollack, “\$14 Million for Research on Stem Cells,” *The New York Times*, Apr. 5, 2006, p. 12.

<sup>9</sup> Marcel Przymusinski and Susie Poppick, “Locals Seek More Stem Cell Funds,” *Yale Daily News*, Jan. 26, 2005.

<sup>10</sup> William Hathaway, “State Lab Nears Cloning Goal, UConn Scientist: Creating Human Embryonic Cells is Within Sight,” *The Hartford Courant*, Mar. 25, 2005, p. A1.

<sup>11</sup> Fran Silverman, “\$100 million Commitment for Stem Cell Research,” *The New York Times*, June 19, 2005, p. 2.

<sup>12</sup> William Hathaway, “Stem Cell Grants Now Available,” *The Hartford Courant*, May 10, 2006, p. B9.

<sup>13</sup> Josh Hafenbrack, “Stem Cell Showdown Heats Up,” *South Florida Sun-Sentinel*, Dec. 6, 2005, p. 1A.

**Illinois.** Following the defeat of several stem cell research measures during the spring 2005 session of the Illinois legislature, on July 12, 2005, Governor Rod Blagojevich signed an executive order authorizing \$10 million in funding for adult, cord blood, and embryonic stem cell research. The money was added to the budget of the Illinois Department of Public Health.<sup>14</sup> In August 2005, as Missouri legislators were debating whether to ban such research, Governor Blagojevich sent a letter to Missouri scientists and researchers inviting them to move to Illinois and find the “freedom to explore the promise of stem cell research.”<sup>15</sup> In April 2006, the state health department, after reviewing 24 applications, awarded 10 grants to seven research centers in Illinois.<sup>16</sup> Governor Blagojevich plans to push for the passage of a five-year \$100 million state research program for embryonic stem cell research.<sup>17</sup>

**Indiana.** In May 2005, Indiana enacted legislation that prohibits reproductive and therapeutic cloning and creates an adult stem cell research center at Indiana University, but did not provide any state funding for the center.

**Maryland.** On March 28, 2005, in an 81-53 vote, the Maryland House approved a bill that would provide \$23 million each year for human embryonic stem cell research, including therapeutic cloning, beginning in FY2007. However, the bill died in the Senate in April 2005 on the last day of the legislative session due to a threatened filibuster.<sup>18</sup> In January 2006, Governor Robert L. Ehrlich announced a \$20 million state funding proposal for stem cell research.<sup>19</sup> In March 2006, the Maryland legislature passed a bill providing \$15 million over one year; Governor Ehrlich signed the legislation in April 2006.<sup>20</sup>

**Massachusetts.** In March 2005, the Massachusetts legislature overwhelmingly approved a bill (Senate 35-2, House 117-37) that clarifies state law on research involving human embryonic stem cells and therapeutic cloning, and ensures that such research is permitted within a regulatory framework. On May 27, 2005, Governor Mitt Romney vetoed the stem cell bill; he was opposed to the

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<sup>14</sup> John Chase, “Governor Slips Stem-Cell Grant by Lawmakers,” *Chicago Tribune*, July 13, 2005, p. 1.

<sup>15</sup> Paul Hampel, “Illinois Governor Invites Stem Cell Research,” *St. Louis Post Dispatch*, Aug. 29, 2005, p. B1.

<sup>16</sup> Press Release, Office of the Governor, “Gov. Blagojevich, Comptroller Hynes Announce \$10 Million in State Stem Cell Research Grants,” Apr. 24, 2006 [<http://www.idph.state.il.us/public/press06/4.24.06StemCellGrants.htm>].

<sup>17</sup> Kate Clements, “Governor Urges Passage of Program,” *The News Gazette*, Mar. 21, 2006, p. A3.

<sup>18</sup> David Nitkin, Sumathi Reddy, and Ivan Penn, “Stem-Cell Bill Dies in Senate Threatened Filibuster on Research Funding Spelled End For Legislation,” *Baltimore Sun*, Apr. 12, 2005, p. A1.

<sup>19</sup> John Wagner, “Ehrlich Hopes to Spend \$20 Million on Stem Cell Research,” *The Washington Post*, Jan. 11, 2006, p. B2.

<sup>20</sup> Jennifer Skalka, “Legislators OK Stem Cell Bill,” *The Baltimore Sun*, Mar. 30, 2006, p. 1A.



therapeutic cloning portion of the bill. On May 31, 2005, the House overrode the Governor's veto on a vote of 112 to 42; the Senate did the same later that day on a vote of 35-2.<sup>21</sup> State funding of research was not provided. In May 2006, a Democratic candidate for Governor, Chris Gabrieli, proposed that the state provide \$1 billion for embryonic stem cell research and life science research over a 10-year period.<sup>22</sup>

**Missouri.** In May 2006, the Missouri Coalition for Lifesaving Cures submitted to the Missouri Secretary of State a petition with 288,991 signatures, more than enough to place an initiative in support of stem cell research on the November 2006 statewide ballot.<sup>23</sup> If voters approve, Missouri would join California as the second state to place protections for conducting stem cell research in the state constitution. Former U.S. Senators Thomas Eagleton and John Danforth, an ordained Episcopal priest, are members of the coalition.<sup>24</sup> Supporters of the initiative include Governor Matt Blunt, the Lance Armstrong Foundation, the Christopher Reeve Foundation, the National Parkinson Foundation and the American Diabetes Association. The amendment would ban human reproductive cloning but protect all stem cell research permitted by federal law, including therapeutic cloning. The petition is in response to efforts in the state legislature that would criminalize such research in the state. The Stowers Institute for Medical Research, a private institution in Kansas City with a \$2 billion endowment, has stopped hiring and delayed a \$300 million expansion until the status of research is resolved either by the legislature or by the public via the petition. Instead, Stowers made a \$6 million donation to the Harvard Stem Cell Institute in 2005.<sup>25</sup>

A lawsuit filed in November 2005 asks the court to block the petition signing because it claims that the ballot language, which states the amendment would “ban human cloning or attempted human cloning,” is deceptive.<sup>26</sup> Many abortion opponents and others opposed to embryonic stem cell research believe that therapeutic cloning creates a human life, even though it may consist of only one or a few hundred cells, and therefore the amendment is sanctioning a type of human cloning. The suit was filed by the Arizona-based Alliance Defense Fund on behalf of Missourians Against Human Cloning. The Missouri Catholic Conference and the Missouri Baptist Convention joined the case in December 2005. On January 19, 2006, after five hours of testimony, the Circuit Court Judge ruled in favor of the

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<sup>21</sup> Raphael Lewis, “Stem Cell Bill Override Turns to Talk of Research Support,” *The Boston Globe*, June 1, 2005, p. A1.

<sup>22</sup> Andrea Estes, “Gabrieli to Offer a \$1B Stem Cell Plan,” *The Boston Globe*, May 11, 2006, p. B1.

<sup>23</sup> Press Release, Missouri Coalition for Lifesaving Cures, “Stem Cell Supporters Submit More Than Enough Signitures to Qualify Stem Cell Initiative for Missouri Ballot,” May 1, 2006 [[http://www.missouricures.com/documents/rel\\_050106.pdf](http://www.missouricures.com/documents/rel_050106.pdf)].

<sup>24</sup> Matthew Franck, “Court Allows Two Church Groups to Join Stem Cell Research Lawsuit,” *St. Louis Post Dispatch*, Dec. 16, 2006, p. C7.

<sup>25</sup> Peter Slevin, “Mo. May Vote on Stem Cell Research,” *The Washington Post*, Dec. 25, 2005, p. A4.

<sup>26</sup> “Judge to Allow Stem Cell Debate,” *The Kansas City Star*, Dec. 26, 2005, p. 3.

ballot language, stating that it was “sufficient, fair, accurate and impartial.”<sup>27</sup> The ruling was appealed by Alliance Defense Fund, and in March 2006, the State Appeals Court ruled to uphold the language of the ballot proposal.<sup>28</sup>

**New Jersey.** In January 2004, New Jersey became the second state in the nation to enact a law that specifically permits embryonic stem cell research. The state law bans human reproductive cloning but permits the use of cloned embryos for stem cell research (NJ Permanent Statutes, Title 26:2Z-2). Like the 2002 California law, New Jersey’s stem cell statute provides assurances to researchers and does not contradict the 2001 Bush policy, which only limits federal funding.

In May 2004, Governor James McGreevey signed a bill to create the first state-funded embryonic stem cell research center, a \$25 million endeavor.<sup>29</sup> The legislature funded the measure on June 25, 2004, passing a state budget that allocates \$11.5 million to the newly chartered Stem Cell Institute of New Jersey.<sup>30</sup>

In December 2005, the New Jersey Commission on Science and Technology announced that it would be awarding 17 grants on stem cell research totaling \$5 million; three of the grants focus on human embryonic stem cell research.<sup>31</sup>

Legislation that would invest up to \$250 million in stem cell research is stalled in the state legislature, its fate tied to a controversial but unrelated bill on needle exchange.<sup>32</sup> Both proposals are backed by Governor Jon Corzine. The stem cell proposal would build a \$150 million Stem Cell Research Institute in New Brunswick on the campus of Rutgers University, and provide \$50 million for a biomedical research facility in Camden, and \$50 million for a laboratory at the New Jersey Institute of Technology in Newark. Funding for the proposal would come from the sale of state bonds to be repaid by revenue from cigarette taxes.

**Ohio.** The Center for Stem Cell and Regenerative Medicine was started in 2003 with \$19.5 million in funding from the state of Ohio.<sup>33</sup> The center is composed of researchers from Case Western Reserve University, University Hospitals of Cleveland, The Cleveland Clinic Foundation, Athersys, Inc., and Ohio State University. The center uses adult human stem cells and tissue engineering technology to develop treatments for human disease. On June 30, 2005, Governor

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<sup>27</sup> Kit Wager, Judge Approves Ballot Language for Stem Cell Vote, *The Kansas City Star*, Jan. 20, 2006, p. 1.

<sup>28</sup> Associated Press, “Stem Cell Ballot Language Upheld,” Mar. 28, 2006.

<sup>29</sup> “U.S. States Making Stem Cell Policies,” *Bionews*, no. 258, May 5, 2004.

<sup>30</sup> Barbara Mantel, “Analysis: New Jersey Is First State to Fund Research on Stem Cells,” *NPR: All Things Considered*, June 25, 2004.

<sup>31</sup> Kitta MacPherson, “NJ Stem Cell Research Takes a First Step as State Awards \$5M,” *The Star-Ledger*, Dec. 17, 2005, p. 1.

<sup>32</sup> Jeff Whelan and Josh Margolin, “Stalling on Two Sensitive Bills Angers Corzine,” *The Star-Ledger*, Apr. 18, 2006, p. 1.

<sup>33</sup> [<http://ora.ra.cwru.edu/stemcellcenter/>].

Bob Taft vetoed language in the state budget that would have prevented state research funds from being used for human embryonic stem cell research. The veto allows state funds to be used for research on human embryonic stem cell lines that existed before August 2001, in accordance with Bush Administration policy.<sup>34</sup> In May 2006, the Third Frontier Commission approved an \$8 million grant in state funds to Case Western Reserve University for the Center for Stem Cell and Regenerative Medicine.<sup>35</sup> The Third Frontier Project was started by Governor Taft in February 2002 in an effort to expand the state's high-tech research capabilities, promote innovation, company formation, and high-paying jobs.

**Virginia.** In March 2005, Virginia enacted legislation that would fund research on adult stem cells via state appropriations to the Christopher Reeve Stem Cell Research Fund. A joint subcommittee was also established to examine the medical, ethical, and scientific policy implications of stem cell research.

**Wisconsin.** In response to the California initiative, Wisconsin Governor Jim Doyle announced on November 17, 2004, that the state was providing nearly \$750 million in public-private investment for biotechnology, health sciences, and stem cell research over the next several years.<sup>36</sup> The Wisconsin investment strategy includes \$375 million for a new research institute, the Wisconsin Institute for Discovery, on the University of Wisconsin-Madison campus. WiCell, a foundation that is using private and federal funds to support stem cell research, will be a part of the institute. The state also plans to invest \$105 million over the next five years in research, education, and public health efforts at the University of Wisconsin Medical School and the Medical College of Wisconsin for stem cell research, as well as regenerative medicine, molecular medicine, neuroscience, and cancer research.

In June 2005, the Wisconsin State Assembly passed a bill (59 to 38) prohibiting both reproductive and therapeutic cloning; the Senate passed the bill (21 to 12) in September 2005. Governor Doyle vetoed the bill on November 3, 2005, stating that the "bill would criminalize some of the most promising scientific techniques used by stem cell researchers, not only potentially delaying cures to some of humanity's oldest and deadliest diseases but also costing Wisconsin jobs in the future."<sup>37</sup>

In April 2006, the University of Wisconsin announced plans for building the new Wisconsin Institute for Discovery with an additional \$100 million in private funding and \$50 million in previously approved state funding. The first phase of construction will begin in late 2007.<sup>38</sup>

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<sup>34</sup> "Ohio Governor Vetoes Stem Cell Budget Limitations," *Research Policy Alert*, July 6, 2005.

<sup>35</sup> Mary Vanac, "NE Ohio Grabs Lots of Biotech Grant Money," *The Plain Dealer*, May 13, 2006, p. C1.

<sup>36</sup> [[http://www.wisgov.state.wi.us/journal\\_media\\_detail\\_print.asp?prid=832](http://www.wisgov.state.wi.us/journal_media_detail_print.asp?prid=832)].

<sup>37</sup> [<http://www.wisgov.state.wi.us/docview.asp?docid=5302>].

<sup>38</sup> Megan Twohey, et al., "Research Hub at UW Gets Huge Gift," *The Milwaukee Journal Sentinel*, Apr. 4, 2006, p. A1.

**Other States.** Other states, including Delaware, Pennsylvania, Texas, and New York are considering legislative options to remain competitive in embryonic stem cell research and prevent the possible relocation of their scientists and biotechnology firms.<sup>39</sup>

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<sup>39</sup> Kelly Rayburn, "States Grapple with Stem Cell Research," *The Wall Street Journal*, Dec. 24, 2004, p. A4; Martin Kasindorf, "Calif. Moves Fast on Stem Cell Grants," *USA Today*, Dec. 17, 2004, p. A3; Andrew J. Hawkins, "State Stem Cell Efforts Gain Momentum in Wake of California's Prop 71," *Washington Fax*, Jan. 18, 2005.