Testimony of Richard M. Doerflinger

before the

House Health and Government Operations Committee
and
House Appropriations Committee

Maryland Legislature

Against House Bill 1183
"Maryland Stem Cell Research Act of 2005"

March 2, 2005

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I have been asked by the Maryland Catholic Conference to present testimony against House Bill 1183, on stem cell research. I am familiar with the bill because similar bills are being marketed across the country by the biotechnology industry and its allies in academia.

Some have said the central purpose of this bill is to provide cures for devastating disease. Yet embryonic stem cell (ESC) research has never produced a treatment for any disease, and it may not do so for decades if ever. Simply throwing more money at an approach that has failed thus far – an approach whose supporters now desperately seek public funds, because discerning private investors are going elsewhere – will not force that approach to cure anything. Nor is there any substantial evidence, nationally or internationally, that medical progress or biotechnology growth depend on a commitment to the kind of research promoted by this bill.[1]

To take two examples, cited in HB 1183's own preamble:

- Some have been led to believe that ESCs will cure the Alzheimer's disease that has afflicted people like former president Ronald Reagan. Yet virtually all scientists agree that this is *not* true. Even young Ron Reagan, who promoted ESC and cloning research at the Democratic National Convention last year, has publicly admitted this. "Alzheimer's is a disease, ironically, that probably won't be amenable to treatment through stem cell therapies," Reagan admitted on the *Hardball* talk show last July 12.[2] When asked why people nonetheless still believe that ESCs

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1 See USCCB Secretariat for Pro-Life Activities, "Human Cloning and Embryo Research: No Road to Biotechnology Growth," at www.usccb.org/prolife/issues/bioethic/embryo/growth11404.htm.

2 See Steven Ertelt, "Pro-Life Advocates React to Reagan Embryonic Stem Cell Research Speech," LifeNews.com, July 28, 2004, at http://66.195.16.55/bio404.html.

are somehow going to cure Alzheimer's disease, a top expert in this field at the National Institutes of Health replied: "To start with, people need a fairy tale."[3]

- Others have claimed that ESCs will restore sensation and movement to spinal cord injury victims like Christopher Reeve, who was paralyzed for years after a riding accident. Yet Mr. Reeve himself, in one of the last published interviews before his death, said he had come to the conclusion that ESCs did *not* look promising in the treatment of chronic spinal cord injuries like his own.[4] Ironically, some patients with injuries like Mr. Reeve's have indeed begun to recover sensation and movement from stem cell treatments after years of paralysis --- but these breakthroughs have come from the *adult* and *umbilical cord blood* stem cells that proponents of this bill tend to dismiss as relatively useless.[5]

The real impact of this bill is to divert $25 million of the state's tobacco settlement fund *away* from basic needs such as cancer prevention and treatment, tobacco and substance abuse cessation programs, basic educational needs of children, and primary health care in underserved areas, and give that money to a speculative science experiment in which thousands or millions of developing human lives will be created solely to be destroyed. The injustice done to unborn humans by this proposal is matched only by its injustice to the poor, the sick, and the needy of our state who will be deprived of real help in order to line the pockets of biotechnology entrepreneurs and researchers.

Let me describe in more detail three kinds of research this bill would authorize and subsidize:

1. Experiments using human embryos specially created by in vitro fertilization (IVF) solely to be destroyed in research.

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3 "[G]iven the lack of any serious suggestion that stem cells themselves have practical potential to treat Alzheimer's, the Reagan-inspired tidal wave of enthusiasm stands as an example of how easily a modest line of scientific inquiry can grow in the public mind to mythological proportions. It is a distortion that some admit is not being aggressively corrected by scientists. 'To start with, people need a fairy tale,' said Ronald D.G. McKay, a stem cell researcher at the National Institute of Neurological Disorders and Stroke." Rick Weiss, "Stem Cells an Unlikely Therapy for Alzheimer's," *Washington Post*, June 10, 2004 at A3.

4 In his interview in the October 2004 issue of *Reader's Digest*, Mr. Reeve said embryonic-stem-cell research should still be pursued because "scientists should be free to pursue every possible avenue. It appears though, at the moment, that embryonic stem cells are effective in treating acute injuries and are not able to do much about chronic injuries." See James Kelly, "The Wrong Path," *National Review Online*, October 21, 2004, at www.nationalreview.com/comment/kelly200410210859.asp.

5 See: Testimony of Laura Dominguez before the U.S. Senate Commerce Subcommittee on Science, Technology, and Space, July 14, 2004, at http://commerce.senate.gov/hearings/testimony.cfm?id=1268&wit_id=3673; Kim Tae-gyu, "Korean Scientists Succeed in Stem Cell Therapy," *The Korea Times*, November 26, 2004, at http://times.hankooki.com/lpage/200411/kt2004112617575710440.htm.

This may not be immediately apparent from the bill's section governing donation of so-called "spare" embryos from fertility clinics (Sec. 20-1109). But that provision is only a distraction; in fact, even its requirements on "spare" embryos are far looser than the requirements already established for these clinics by the fertility industry itself.[6] That section is immediately followed by the statement: "Nothing in this subtitle shall be construed to prohibit the creation of stem cell lines to be used for therapeutic research purposes" (Sec. 20-1110). What creates an embryonic stem cell line is the killing of the one-week-old embryo for its stem cells. And this policy statement is not restricted to embryos that were created for reproduction but are now considered "spare." In fact, the bill elsewhere declares that derivation and use of ESCs "from any source" must be allowed, and this surely includes embryos specially created just for that purpose (Sec. 20-1102).

A program of this kind was begun at a fertility clinic in Norfolk, Virginia in 2001, but was discontinued after it provoked widespread moral outrage from lawmakers and others.[7] Even to many people who favor research on existing "spare" embryos, the idea of creating early human lives solely to destroy them takes a giant step toward treating life as a mere instrument. It also demands a very cavalier attitude toward women's health: Women who are perfectly healthy and fertile must be enlisted to receive potentially dangerous fertility drugs to stimulate them to produce many eggs at once, to produce large numbers of embryos for research.[8] Experts at Johns Hopkins University and elsewhere have written that soliciting such "donations" will be necessary to make ESC-based treatments possible, because the "spare" embryos now in fertility clinics' freezers are not numerous enough or genetically diverse enough to provide compatible cells for any large number of patients. Specifically, special efforts will be made to encourage African American women to undergo this risky egg donation process, because racial minorities are underrepresented among the clientele of fertility clinics.[9]

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6 The American Society for Reproductive Medicine urges clinics to inform parents that the embryos will be used for stem cell research, and that this will involve "the embryo's destruction"; to tell them what area of stem cell research they will be used for; to explain that the cells may be used to create cell lines that will develop indefinitely; etc. All this is absent from HB 1183. See Ethics Committee of the American Society for Reproductive Medicine, "Donating spare embryos for embryonic stem-cell research," 78 *Fertility and Sterility* 957-60 (November 2002) at 958-9.

7 See Carol Morello, "Center shifts stem cell approach; Va. Institute will stop creating human embryos for research," *Washington Post*, January 18, 2002, at A14.

8 In the Norfolk project, twelve women had to be paid $1500 to $2000 each to compensate them for undergoing these risks; they donated a total of 162 eggs, which were used to create 110 new embryos; 40 of these survived to the blastocyst stage and were killed for their stem cells, producing a grand total of only 3 ESC lines. See Deborah Josefson, "Embryos created for stem cell research," 323 *British Medical Journal* 127 (July 21, 2001), at http://bmj.bmjjournals.com/cgi/content/full/323/7305/127/a.

9 Joanna Downer, "Panel Looks to Future of Stem Cell Use," *The JHU Gazette*, November 17, 2003, at www.jhu.edu/~gazette/2003/17nov03/17stem.html. It is notable that while HB 1183 bans the purchase of human embryos for stem cell research, it places no limit on using money to solicit women to donate eggs for making embryos.

2. **Experiments using human cloning ("somatic cell nuclear transplantation") to mass-produce human embryos for destructive research.**

The bill authorizes these experiments by supporting "research involving the derivation and use of human embryonic stem cells… from any source, *including somatic cell nuclear transplantation*" (Sec. 20-1102).

"Somatic cell nuclear transplantation" or "somatic cell nuclear transfer" (SCNT) is simply the scientific name for the cloning procedure that created Dolly the sheep. This is the procedure that some want to use to make human embryos for research, and that others want to use to make human embryos for attempts at producing live-born infants. But the cloning procedure is the same in all these cases. Scientists who *support* the cloning of human embryos for research purposes admit this -- and they also admit that allowing SCNT for such research purposes will make its use for babymaking much more likely. If you allow research cloning, you will help bring about so-called "reproductive cloning."[10]

Partly from this concern, and partly from concern about research cloning itself, 30 nations have banned human cloning by SCNT for any purpose, including Canada, Australia, Germany, Italy, Switzerland and Norway.[11] In the United States, the procedure that this bill would allow and fund is prohibited in Michigan, North Dakota, South Dakota, Iowa and Virginia.12

Sponsors of HB 1183 nonetheless persist in spreading the false message that this bill bans "human cloning." The bill does say those words, but then creates its own bizarre definition of "human cloning": **"The replication of a *human being* through the production of a precise genetic copy of human DNA or any other human molecule, cell, or tissue, in order to create a new *human being*."**

This definition is so scientifically confused that it is hard to tell what it is getting at. No matter how many times you copy a molecule, a cell (other than an embryo), or a tissue, you will never produce a human being. Federal and state human cloning bans supported by the Catholic

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10 One group of researchers and ethicists who *support* cloning for research purposes (which they call CRNT for "cell replacement through nuclear transfer") admits that "the techniques developed in CRNT research can prepare the way scientifically and technically for efforts at reproductive cloning." Robert Lanza et al., "The ethical validity of using nuclear transfer in human transplantation," 284 (24) *Journal of the American Medical Association* 3175-9 (December 27, 2000) at 3178. The American Society for Reproductive Medicine (ASRM) says regarding the use of somatic cell nuclear transplantation to clone human embryos for research purposes: "If undertaken, the development of SCNT for such therapeutic purposes, in which embryos are not transferred for pregnancy, is likely to produce knowledge that could be used to achieve reproductive SCNT." ASRM Ethics Committee, "Human somatic cell nuclear transfer (cloning)," 74 (5) *Fertility and Sterility* 873-6 (November 2000) at 873.

11 See Institute on Biotechnology and the Human Future, "International legal Situation - Cloning," at www.thehumanfuture.org/documents/clon_international.pdf.

12 See USCCB Secretariat for Pro-Life Activities, "Current State Laws on Human Cloning," at www.usccb.org/prolife/issues/bioethic/statelaw.htm.

Church actually allow the copying of molecules, tissues and DNA strands.

But obviously the key here is the term "human being," which occurs twice in the definition: You can't replicate a human being by doing any of this copying in order to create a human being. Note that this definition is logically circular, and on that basis alone would be subject to a charge of unconstitutional vagueness. But it is at least clear that we absolutely must see the bill's definition of "human being" to figure out what it bans.

Yet the bill leaves that term without any definition at all.

Where will we turn for this all-important definition of "human being"? Perhaps to current abortion policy, as set forth in the U.S. Supreme Court's *Roe v. Wade* decision. But in that case, "human being" means a *live-born* human being. (The term will not even include a fully developed child who is mostly but not entirely born, because the Supreme Court's ruling on partial-birth abortion effectively excludes that child from full status as a human being.)

But if that is what the bill means, it does not ban cloning. It bans birth. It says you may perform the cloning procedure, but you *must not* do so in order to develop the cloned embryo to the point where it would become a (born) human being. If you have created a cloned human embryo, and placed the embryo in a woman's womb (two actions that are *allowed* under this bill), you must show you did not do this to make a "human being," by agreeing to have an abortion at some point before completion of birth.

Could the bill really be intended to do this? To answer that question, we must turn again to the bill's core provision authorizing "stem cell" research. It turns out that the bill's authorization of human cloning does not stop with the one-week-old embryo.

3. Experiments in developing cloned (or fertilized) embryos to the fetal stage in women's wombs, to kill them for their more developed stem cells ("fetus farming").

This sounds like a nightmarish science fiction scenario, but it is exactly what Sec. 20-1102 of the bill permits:

"A person may conduct research involving the derivation and use of human embryonic stem cells, human embryonic germ cells, and human adult stem cells from any source, including somatic cell nuclear transplantation."

We need to unpack this sentence:

- As stated above, SCNT is simply the scientific name for the human cloning procedure. It creates a new human embryo who is genetically very similar to a pre-existing human.

- "Human embryonic stem cells" are obtained by killing that embryo at about one week of

development.

- "Human embryonic germ cells" are obtained from the reproductive tracts of *fetal* humans at about eight *weeks* of development.

- "Human adult stem cells" are obtained from the *developed* organs and tissues of late-term fetuses, placentas and umbilical cords, and born human beings.

Under HB 1183, research deriving and using ALL of these has to be allowed (and funded by the state), using somatic cell nuclear transplantation as one source. **So Maryland researchers will be encouraged to clone embryos, put them in wombs, and grow them at least to the late fetal stage where more specialized "adult stem cells" can be obtained. Then they will be *required* by law to kill these late-term unborn children so they can't become (born) "human beings."**

This is the only way to make any sense of the bill's core provision on stem cell research and SCNT, and its strangely defined ban on "human cloning." Otherwise the provisions would contradict each other, both authorizing and banning the use of SCNT to create and grow humans for their more developed cells and tissues.

The idea of using cloning to mass-produce and harvest human embryos as nothing more than agricultural products is horrific enough. The idea of extending this into the "farming" of fetal humans for spare parts, however, demeans human life at much later stages, and also requires exploiting women in a new way – not only misusing them as "egg factories" to make cloned embryos, but also misusing them as incubators for unborn children who were created in order to be "harvested" for their cells and tissues.

Why bills like HB 1183 are being recommended to state legislatures

The language of bills like HB 1183 is no accident, at least from the viewpoint of outside groups supporting it. A similar bill was enacted into law last year in New Jersey. It has exactly the same provision encouraging "stem cell research" (including research on adult stem cells derived from cloning) as HB 1183. It also bans "human cloning," but then says one is guilty of "cloning" only if one develops the cloned human *through* the embryonic, fetal *and newborn* stages to produce a human "individual."[13] Similar bills have been introduced in other states, with the support of state biotechnology alliances.[14]

Such laws to allow "fetus farming" are proposed because certain interests in the biotechnology industry, fixated on the pursuit of human cloning for biomedical research, are

13 New Jersey, P.L. 2003 (Chapter 203), approved January 2, 2004.

14 Americans to Ban Cloning, "Report: State Bills on Human Cloning," March 26, 2003, at http://cloninginformation.org/info/ABC-State-Laws.htm.

afraid that their original model for "therapeutic cloning" may not work.

The original idea was to clone one-week-old embryos, then destroy these embryos for embryonic stem cells which would be a genetic match to the patient who donated his or her body cell for the cloning procedure. But "therapeutic cloning" is not working well, even in animals. Embryonic stem cells are too difficult to maintain, too uncontrollable, too likely to turn into lethal tumors in animals' bodies.[15] Problems with cloned embryos are even more serious: It is terribly difficult to produce even one live embryo from the procedure, and even those who survive have many problems in gene expression.[16] But it seems these problems may become less severe later if the cloned embryo can manage to survive to a later (fetal) stage.[17]

Three animal studies are most often cited when scientists are asked to document the therapeutic benefits of stem cells from cloned embryos. One, designed to provide new kidney tissue, required gestating the cloned cow embryo in a uterus and then aborting it to obtain *fetal* kidney tissue.[18] The second, designed to correct a genetically-based immune deficiency, required taking the new mouse (produced by cloning and genetic modification) to the *newborn* stage and harvesting its *adult* stem cells to treat the original mouse.[19] The third, an attempt to obtain stem cells to repair damaged hearts in mice, required growing the cloned mouse embryos in mice's wombs for 11 to 13 days (the equivalent of the fifth month in humans), then aborting them for their fetal stem cells.[20]

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15 USCCB Secretariat for Pro-Life Activities, "Practical Problems with Embryonic Stem Cells," at www.usccb.org/prolife/issues/bioethic/stemcell/obstacles51004.htm.

16 Id., "Practical Obstacles to 'Therapeutic" Cloning," at www.usccb.org/prolife/issues/bioethic/cloning/clonprob11404.htm.

17 See Josef Fulka et al., "Do cloned mammals skip a reprogramming step?", 22 *Nature Biotechnology* 25-6 (January 2004).

18 Robert Lanza et al., "Generation of histocompatible tissues using nuclear transplantation," 20(7) *Nature Biotechnology* 689-696 (July 2002). The authors declared: "Because the cloned cells were derived from early-stage fetuses, this approach is not an example of therapeutic cloning and would not be undertaken in humans." Id. at 689.

19 William M. Rideout III et al., "Correction of a Genetic Defect by Nuclear Transplantation and Combined Cell and Gene Therapy," 109 *Cell* 17-27 (April 5, 2002). See Americans to Ban Cloning, "Why the 'Successful' Mouse 'Therapeutic' Cloning Really Didn't Work," at www.cloninginformation.org/info/unsuccessful_mouse_therapy.htm.

20 Robert Lanza et al., "Regeneration of the Infarcted Heart With Stem Cells Derived by Nuclear Transplantation," 94 *Circulation Research* 820-827 (April 2, 2004). The online data supplement to this study reveals the use of wombs to gestate cloned mice to the fetal stage: "Cleaved (2-cell) embryos were transferred… to the oviducts of pseudopregnant CD1 surrogate mothers. Cloned fetuses recovered at 11 to 13 days of gestation were used as source of liver cells." Online Data Supplement, at http://circres.ahajournals.org/cgi/data/94/6/820/DC1/1. This time, far from denying that this is a model for human "therapeutic" cloning, the researchers insisted on "the relevance of the present study to ischemic heart disease and post-infarction heart failure in humans." Advanced Cell Technology, "Cloned Stem Cells Regenerate Heart Muscle Following a Heart Attack," February 10, 2004, on The Healthcare Sales and Marketing Network, http://salesandmarketingnetwork.com/news_release.php?ID=14109&key=Advanced%20Cell%20Technology.

New state bills on cloning such as HB 1183 are designed to keep researchers' options open, to make it possible to transfer these animal models to human use.

This means that in approving this bill Maryland would be marking out a path that is rejected by the vast majority of Americans, and apparently by every single member of Congress. For no member of Congress claims to support allowing cloned embryos to be placed in a womb and gestated to the fetal or newborn stage. Some members of Congress, including some of the Maryland congressional delegation, say they want to allow use of cloning to make embryos who will be destroyed for their stem cells at an early stage in the laboratory -- but bills like these show that the research community is abandoning that stance and moving on to the next step.

Ethical limits?

Does HB 1183 prevent these horrors by its call for attention to ethical limits? No, it does not. The bill contains some vague talk about considering "ethical and policy concerns," but it sets no actual limits. Not only can human embryos and fetuses be created solely to be destroyed, but women can be exploited for their eggs and their wombs, and patients can be used as guinea pigs for untried and possibly dangerous treatments. Several features of the system established by this bill for approving state-funded cloning experiments are especially troubling:

1. Procedures for the review of research proposals are to be established by a Scientific Peer Review Committee, on which members with a vested interest in maximum research freedom (representing the universities and the for-profit biotech companies) will outnumber those appointed by state officials (Sec. 20-1105).

2. This committee's guidelines are to be "based on the guidelines of the federal National Institutes of Health." This cannot be meant seriously, since NIH guidelines *prohibit* most of the research this bill is designed to fund. It seems the guidelines will be based on NIH standards very loosely indeed.

3. The other safeguard against misuse of human beings in this research will be each institution's Institutional Review Board (IRB). The sponsors of HB 1183 are apparently unaware that Maryland courts have condemned these IRBs for being more committed to researchers' goals than to ethics or the protection of human subjects. In 2001, Maryland's highest court found that the IRB at Johns Hopkins University had "abdicated" its responsibility to protect children from research risks, and shown itself "willing to aid researchers in getting around federal regulations designed to protect children used as subjects in nontherapeutic research."[21] This ruling concerned a Johns Hopkins study of the effects of lead paint on low-income children in the inner city. The Johns Hopkins

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21 *Grimes v. Kennedy Krieger Institute*, 782 A.2d 807 (Md. 2001) at 813, 814.

> IRB allowed researchers to expose children to the harmful effects of the paint after federal standards would have required that they stop the experiment and tell the families involved of their risk. The court found that the IRB had conspired with researchers to evade the NIH's safety standards, to retain the "control group" for their experiment as long as possible. No one who reads this decision will want to entrust ethically controversial research decisions to IRBs (particularly to the Johns Hopkins IRB). Yet this bill not only gives free rein to IRBs – it even gives Johns Hopkins two seats on the ten-member Peer Review Committee, where it can promote its approach as a model to others.

This approach of handing over control of public funds to special interests in the research and biotechnology community seems modeled on the initiative recently approved in California in the form of Proposition 71. But Maryland legislators should learn from California's experience.

Already the initial enthusiasm for Proposition 71 has given way to serious doubts, as the people and their elected representatives realize they have placed enormous resources and power in the hands of people who may not hold the common good of all the people of the state as their highest priority. News accounts are now centering on the profit motives and the conflicts of interest among those who promoted Proposition 71[22] -- as well as on the exaggerated claims for miracle cures that were used to railroad the voters into a very expensive gamble.[23] Already the proposition is the subject of a legal challenge, arguing that it violates California's state constitutional guarantee against entrusting the allocation of public funds to non-public entities.[24] Maryland should pay careful attention to the second thoughts California citizens and journalists are having about their measure, and should not repeat their mistake.

Conclusion

Let me end with a message of hope. Enormously promising new treatments have begun to emerge from medical research. In clinical trials, patients have been successfully treated for Parkinson's disease, sickle-cell anemia, thalassemia, Type I diabetes, severe combined immune deficiency, corneal damage, heart disease, bone and cartilage injury, and other conditions. Early

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22 See: John M. Broder, "California's New Stem-Cell Initiative Is Already Raising Concerns," *The New York Times*, November 27, 2004, A10; Michael Hiltzik, "Stem Cell Initiative Lacks Oversight," *Los Angeles Times*, December 9, 2004, at www.latimes.com/business/la-fi-golden9dec09,0,621989.column?coll=la-home-utilities; Ariana Eunjung Cha, "Controversy snags stem cell initiative: Ethical conflicts alleged in novel California program," *Chicago Tribune*, February 14, 2005, at www.chicagotribune.com/features/lifestyle/health/chi-0502140207feb14,1,6093670.story?coll=chi-health-hed&ctrack=1&cset=true.

23 Commenting after the vote on claims that Proposition 71 would lead to cures in five to ten years, an investigative journalist writes: "Most people involved in Prop. 71 knew that both the timeline and the miracle claims were hype, pure and simple." Diana Kapp, "The $3 Billion Cell Job," *San Francisco*, January 2005, 56-60, 115-9 at 118.

24 See Marc Strassman, "Dana Cody, executive director, Life Legal Defense Foundation, explains its anti-Proposition 71 lawsuit," California Politics Today #300, February 26, 2005, at http://etopiamedia.net/empnn/pages/cpt-emnn/cpt-emnn300-5551212.html (with links to the court documents).

trials in treating patients with chronic spinal cord injury are showing great promise. All these trials used *adult* stem cells, other adult cells obtained ethically, or sources such as umbilical cord blood.[25] Some of this progress, especially in the use of bone marrow stem cells and in repair of heart damage, has come from researchers in Maryland, whose efforts are likely to pay off if given more funding.[26]

By contrast, no treatment now in trials, or on the near horizon, comes from embryonic stem cells or from so-called "therapeutic cloning." Focusing on these most controversial and most speculative approaches would divert our state's resources and attention away from the promising treatments now on the brink of helping millions of patients – and may well slow down the medical progress that patients deserve.

We need not set aside human dignity in the pursuit of technical progress. We can fully respect and promote sound ethics and promising medicine at the same time, for there is no conflict between them. I urge the committees to begin this journey to ethically responsible medical progress by defeating HB 1183.

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25 See: the advances reported at www.stemcellresearch.org; "Disorders and Conditions Treated with Non-Embryonic Stem Cells" (compiled from the NIH database and the National Marrow Donor Program), *Congressional Record*, September 9, 2004, at H6956-7; Cord Blood Registry, "Diseases Treated with Stem Cells," .at www.cordblood.com/cord_blood_banking_with_cbr/banking/diseases_treated.asp.

26 See: Jen Waters, "Revolution in heart surgery," *The Washington Times*, February 8, 2005, B1 and B4 (on progress toward using adult stem cells to repair and regenerate heart tissue at Johns Hopkins); Osiris Therapeutics, "Osiris First to Announce FDA Fast Track Designation for a Stem Cell Product," January 31, 2005, at www.osiristx.com/index_files/PressReleases013105.htm (Baltimore biotech firm advancing toward clinical use of an adult stem cell product for treating Graft v. Host Disease and other immunology problems); Johns Hopkins Medicine, "Stem Cells Can Convert to Liver Tissue, Help Restore Damaged Organ," June 1, 2004, at www.hopkinsmedicine.org/Press_releases/2004/06_01_04.html. A personal note: When I testified against a previous version of HB 1183 in 2004, a researcher from Johns Hopkins who supported the bill said my testimony was misguided because there are many kinds of cells that adult stem cells cannot produce. When I asked him to name one example, he said, "Liver." The last study cited above, confirming that adult bone marrow stem cells can produce beneficial liver cells, was published by his own institution a few weeks later.