Banning therapeutic cloning would block research that could lead to cures for many diseases. In therapeutic cloning, genetic material from an adult cell is placed inside an egg to grow beneficial stem cells, not to produce a baby. Therapeutic cloning would allow a patient's own genetic material to be used to repair his or her damaged cells. There is broad consensus in the scientific community that therapeutic cloning could lead to remedies for diseases such as Alzheimer's and cancer. It should be legal and regulated.

In his essay, "Why I Oppose Human Cloning," Jeremy Rifkin proposes that his view is widely shared within the progressive community: "many of us in the progressive left are equally opposed to both therapeutic and full birth cloning.... Earlier this year, sixty-seven leading progressives lent their support to legislation that would outlaw therapeutic and full birth cloning. The signatories of the anti-cloning petition included many of the best-known intellectuals and activists in left circles today." In fact, the petition came from Mr. Rifkin himself (the document became known as "the Rifkin petition"), and two of the petition's signers, Stanley Aronowitz and Quentin Young, have since withdrawn their support from the petition.

Some of Jeremy Rifkin's criticisms of reproductive cloning are well taken; I do not have the space here to discuss his argument in detail. But his campaign against therapeutic cloning (known by scientists as Somatic Cell Nuclear Transfer, or SCNT, which is explained below) is not equally justified.

In the domain of biomedicine, progressives can readily identify with Rifkin's opposition to "efforts to reduce human life and its various parts and processes to the status of mere research tools, manufactured products, and utilities." But despite his assertions to the contrary, few among us can see the link he assumes between the research cloning of embryonic stems cells for therapeutic purposes and the larger doomsday scenario that he lays out. The stem cell issue—which is receiving a lot of attention from the national media—has provided Rifkin with a wedge for introducing his anti-biotechnology agenda to a wide audience at the cost of neglecting the specific intentions and prospects of scientists working with embryonic stem cells to better understand disease processes and to develop new therapies based on that understanding.

The religious right

In its campaign to discredit embryonic stem cell research, the religious right has blurred the differences between therapeutic and reproductive cloning, creating in the popular imagination nightmare visions of cloned babies born into brave new worlds (evoked as well in popular entertainment like the movie Attack of the Clones). But therapeutic cloning provides scant supplies for these science fiction scenarios. This research is already subject to federal regulation, does not involve significant health risks to cell donors, does not alter existing genomes, and takes place in a laboratory setting with a handful of embryonic stem cells that will not be implanted in a womb.

Our task as progressives should be to expose the way that anti-abortion spokespersons twist the facts
about this kind of research. Instead, Rifkin has allied himself with these very forces. He rightly points out that biomedical research needs careful ethical evaluation. And in his book *The Biotech Century*, he elaborated a fairly reasonable dialectical approach to such research, recognizing its enormous potential for good, while pointing out also the dangers. But now his blanket opposition to the cloning of human embryos abandons that balance in favor of dubious assumptions and misleading arguments. Banning therapeutic cloning would obstruct research paths that could lead to effective remedies for major illnesses such as childhood leukemia, diabetes, Alzheimer's, and Parkinson's disease.

Rifkin argues that "By concentrating research almost exclusively on magic bullets in the form of gene replacements, the medical community forecloses the less invasive option of prevention...." This is erroneous on two counts. First, it overlooks what may be the most valuable result of research cloning: A better understanding of disease processes. Researchers can take a diseased cell from an adult (the disease in question could be cancer, cardiovascular disease, Alzheimer's, or another disease in which genetic inheritance or mutation plays a role) and use embryonic cloning to create a stem cell line from it. (The line's originating cells are harvested from the cloned embryo.) Studying a stem cell line of this kind—seeing how the disease develops as the stem cells differentiate—will help us understand that development and find remedies for it. For example, the way in which embryonic stem cells, which have been cloned using adult cells from an Alzheimer's patient, differentiate into brain cells can be compared with the normal formation of brain cells, thereby providing new information that might help us cure this disease. If SCNT research is criminalized, this entire domain of investigation will be shut down.

Second, research of this kind needn't be counterposed to preventive measures (which indeed should be medicine's highest priority, as I've argued in an essay published in *Tikkun* March/April 2002). Consider diabetes for instance. Certainly we need to address the social/environmental factors that may be contributing to its increase over the past two decades. But anyone who has seen a child suffering from diabetes surely hopes also that a medical remedy will be found.

**Regulation of complex technologies**

Rifkin is right, however, to ask basic questions about the priorities and governance of biomedical research. Stem cell experimentation, for example, is a complex, multifaceted enterprise that advances at the cutting edge of scientific understanding. How can it be made to conform to democratically-arrived-at norms of social responsibility? How can lay persons, lacking expertise in specialized scientific/technological domains, intelligently evaluate the research approaches that scientists come up with?

Progressives have faced this quandary many times before—in our opposition to the nuclear power industry, for instance. In arriving at our judgments about the advisability of using complex technologies, we rely a lot upon the views of authorities who are respected within progressive/environmentalist circles—upon "our" experts, whom we take to be more conscientious and less aligned with profit-seeking interests than are the advocates on "the other side."

In the domain of biotechnology, which deploys methods of cellular and molecular investigation that
most of us know little or nothing about, how are we to figure out which pathways are ethically and politically acceptable? We may accept the guidance of people like Jeremy Rifkin who have considerable specialized knowledge. Rifkin himself would probably agree, however, that we cannot blindly trust the "experts," even when they espouse values that we believe in.

Here are responses to some of the questions that have been raised about therapeutic cloning research:

**Why we need therapeutic cloning**

The diagram labeled "Research Cloning" illustrates the crucial differences between two kinds of cloning: therapeutic and reproductive. Therapeutic cloning places the genetic material from an adult cell inside an egg, in order to grow therapeutically beneficial stem cells, not to produce a baby. These cells can be used in scientific research to deepen our comprehension of disease origins and development, and to develop new medical therapies.

Many debilitating medical conditions are caused by cell damage. Therapeutic cloning (SCNT), could allow a patient's own genetic material to be used to repair that damage. Replacement cells—neurons, blood cells, pancreatic cells, etc.—generated from cloned stem cells would be much less likely to be rejected by a patient's immune system, since they would be genetically identical to the debilitated tissue they were replacing.

Forty Nobel Laureates recently issued a statement that finds this research promising. They cite the prospect of developing cell-replacement therapies, and also of advancing our understanding of fundamental disease processes: "it may be possible to use nuclear transplantation technology to produce patient-specific embryonic stem cells that could overcome the rejection normally associated with tissue and organ transplantation. Nuclear transplantation technology might also permit the creation of embryonic stem cells with defined genetic constitution, permitting a new and powerful approach to understanding how inherited predispositions lead to a variety of cancers and neurological diseases such as Parkinson's and Alzheimer's diseases."

Among biomedical researchers in the United States, there is a broad consensus that the research cloning of embryonic stem cells may lead to new remedies for severe childhood and adult illnesses that afflict millions of people. On February 8 of this year [2002], the National Academy of Sciences concluded that therapeutic cloning "offers great promise for treating diseases.... Closing these avenues of research may have real costs for millions of people who now have these diseases."

**Embryonic stem cells**

Rifkin suggests that "few, if any, on the left oppose research on adult stem cells, which can be taken from individuals after birth and have proved promising in both animal studies and clinical trials. This 'soft path' approach poses none of the ethical, social, and economic risks of strategies using embryo stem cells." Most scientists working in this area, however, believe that adult stem cells are less promising for research purposes than embryonic ones. Embryonic stem cells haven't been damaged
by aging, and they show a much greater plasticity—the potential for developing into a variety of specialized cells that could be used in life-saving therapies—than adult ones do. Two recent studies published in *Nature* (March 13, 2002), one of them conducted at the University of Florida and the other by researchers at the University of Edinburgh, cast doubt on previous claims that adult stem cells could revert to an earlier stage of development. In any event, researchers in this domain need to study and work with both embryonic and adult stem cells. We do not yet know which particular path of investigation will lead to useful therapies.

There is an additional and very important use of cloned embryonic stem cells in medical research that adult stem cells cannot serve. As explained above, stem cell lines that result from the embryonic cloning of diseased cells can help us better understand the inception and development of major diseases.

**Will therapeutic cloning inevitably lead us onto a slippery slope to the production of cloned human babies?** No. Federal authority can make it illegal to implant a cloned embryo into a uterus. Our model for regulatory oversight should be the English Fertilisation and Embryology Act of 1990, which limits any experimentation with embryos to the first fourteen days. It is at fourteen days that an embryo first begins to develop the primitive streak, the first indication of a nervous system. It is also at fourteen days that, in all but the most extreme case, an embryo loses the ability to split into two and become twins. The oversight mandated by the English Act has prevented any “slippery slope” in the United Kingdom and there is no reason to assume that a similar approach would not work as well in this country.

**Will therapeutic cloning lead to unethical incentives being offered for women’s eggs, as Rifkin suggests?** The prospect of an increased market for women’s eggs is a legitimate concern. But our aim should be to regulate, not to criminalize, the procedures whereby scientists obtain egg cells for research purposes. Moreover, there are clearly some cases where the concern for improper incentives or risk of egg donation would not be relevant—when a mother wishes to donate an egg to help her child, for example, or to create stem cells that could be used to save her own life. If a person can agree to participate, for example, in a dangerous malaria vaccine study to help prevent or cure this disease, why should she be prevented from donating eggs for similar (but much safer) lifesaving research?

**Cloning should be regulated**

All of the constituencies that have a stake in the benefits of this research need to devise effective regulations for its continuation. We agree with Jeremy Rifkin that we ought not to trust blindly the scientific community or biotech industry. Legislative bodies—with the participation of scientists, medical practitioners, patients’ groups, and other interested parties—need to improve already existing statutes regarding egg donation for any purpose: in vitro fertilization, surrogate motherhood, or therapeutic cloning. This is the democratic way to address the relevant social and ethical concerns.

It is also important to note that by researching therapeutic cloning, scientists hope to understand the biological properties of a cloned egg cell that induce it to generate stem cells. Once they learn how this
Irving Weissman, a biology professor at Stanford, compares the current debate over stem cell research to the 1970s controversy over recombinant DNA technology, which now produces a broad range of medicines, including cancer and diabetes treatments. He points out that "the lives of hundreds of thousands of Americans each year are saved or made better by such recombinant DNA products.... I believe the kind of medical research that can follow from nuclear transplantation will have a similar magnitude of medical benefits."

Because of its therapeutic potential, research that clones stem cells for medical purposes deserves our support. It should be publicly funded and better regulated, not outlawed.

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