Stem Cell Questions and Answers

If some human embryos will remain in frozen storage and ultimately be discarded anyway, why is it wrong to try to get some good out of them?

In the end we will all die anyway, but that gives no one a right to kill us. In any case, these embryos will not die because they are inherently unable to survive, but because others are choosing to hand them over for destructive research instead of letting them implant in their mother's womb. One wrong choice does not justify an additional wrong choice to kill them for research, much less a choice to make taxpayers support such destruction. The idea of experimenting on human beings because they may die anyway also poses a grave threat to convicted prisoners, terminally ill patients, and others.

Haven't doctors, scientists, and commentators said that embryonic stem cell research will lead to the cure of many diseases?

Some have made this claim, but in fact this is largely speculation. Embryonic stem cells have never treated a human patient, and animal trials suggest that they are too genetically unstable and too likely to form lethal tumors to be used for treatment any time soon. Years ago it was said that stem cells from embryos would be the most useful because they are so fast-growing and versatile, able to make virtually any kind of cell. But those advantages become disadvantages when these cells make tumors, creating a condition worse than the disease. Yet many supporters remain wedded to this approach, having invested a great deal of money and effort and hoping they can still make it work. This kind of exaggerated "promise" has misled researchers and patient groups before — most obviously in the case of fetal tissue from abortions, which a decade ago was said to promise miracle cures and has produced nothing of the kind.

Did the federal government in 2001 forbid funding any embryonic stem cell research?

No. In fact, the federal government gave $25 million to human embryonic stem cell research last year. But on August 9, 2001, President Bush said that federally funded research would use only embryonic stem cells already in existence (obtained by destroying embryos prior to that date). In this way, he reasoned, federal funds could be used to explore this research, without encouraging researchers to destroy new embryos in order to obtain federal grants. Some of these existing stem cell samples have been used to create more than 20 cell lines for research, and others remain in storage for possible use in creating new cell lines in the future. There is no legal limit on the amount of funding that can be used for this avenue; if the total funding for it is relatively small, that is chiefly because researchers are not requesting the funds as they are finding other avenues more promising.

Has research using adult stem cells ever accomplished anything?

Thousands of lives have been saved by adult stem cells—most often in the form of "bone marrow transplants" for leukemia and other conditions (where the active ingredient in the bone marrow is stem cells). Today, adult stem cells have been used to help people with Parkinson's disease, spinal cord injury, sickle-cell anemia, heart damage, corneal damage, and dozens of other conditions. The danger is that this progress toward cures will be halted or slowed by campaigns that divert attention and resources toward embryonic stem cell research.

Can stem cells be stored in a bank?

A: Yes, like donated blood or bone marrow, they can be frozen and banked. In 2003, for example, Congress approved funds to help create a nationwide umbilical cord blood stem cell bank, in light of the many clinical benefits being discovered from these cells now usually discarded after live births. Many of the embryonic stem cell samples eligible for federally funded research under the current policy also remain frozen in banks, to be thawed and turned into stem cell lines when needed.

What is a stem cell line?

It is an ongoing, living colony of stem cells in a laboratory, from which cells can be obtained for research or other uses. Sometimes these are called "immortal" cell lines, but that is misleading because they do eventually deteriorate. Embryonic stem cells are said to be easier to grow in a stem cell line, but they also tend to develop serious genetic abnormalities associated with cancer.

What are the advantages of harvesting donor cells from the intended recipient of the stem cell therapy?

Because these cells come from the patient, they are an exact match and will not be rejected by the body as foreign tissue. Also, because no foreign substance is placed in the body, there are fewer regulatory barriers to their medical use.

Who is funding stem cell research? What role is federal funding playing in determining research priorities?

Many private foundations and for-profit biotechnology companies fund stem cell research, but the federal government (especially through the National Institutes of Health) remains the largest source of funds. The government's funding priorities have a large influence on the direction that medical research takes. Since available research funds began being diverted toward exploring embryonic stem cell research, some very promising adult stem cell avenues for treating juvenile diabetes, spinal cord injury, Parkinson's disease, etc. have been underappreciated and underfunded. Many advances in these fields have emerged from other countries.

What is human cloning and how is it related to stem cell research?

In human cloning, the DNA from the nucleus of a person's body cell is inserted into an egg whose own genetic material has been removed, and the egg is then stimulated to begin embryonic development. The resulting cloned embryo would genetically be an almost identical twin to the person supplying the body cell. This research overlaps with the stem cell issue. That is, human cloning might be done to create an embryo who will be destroyed to provide stem cells genetically matched to a patient, so the cells will not be rejected as foreign tissue. But some cloning research is done for other purposes — for example, to create embryos with devastating illnesses from the body cells of sick patients, to study the early progress of that disease. Most embryonic stem cell research involves embryos created by in vitro fertilization, not cloning.