5 Are there alternatives to using embryonic stem cells for research?

Yes! Fortunately, scientific papers are published virtually every month that show that *adult stem cells* are being used to cure many types of diseases:

• It has now been found that adult stem cells (including umbilical cord cells) can differentiate into nerve, skin, lung, liver, cartilage, bone, and insulin-producing pancreatic islet cells. They have been used to treat leukemia, sickle cell anemia, stroke, spinal cord injuries, and more.

• Adult stem cell lines can be grown from the patient's own body, thus overcoming any potential immune system problems and any need for immunosuppressive drug therapy.

• Adult stem cells are more controllable, and haven't been found in experiments to form tumors or to behave differently from cell to cell, as with embryonic stem cells.

6 What is the current state of government involvement?

In March 2009, President Barack Obama lifted his predecessor's restrictions on the use of federal taxpayer funds for embryonic stem-cell research, and at the same time rescinded an executive order that encouraged the National Institutes of Health to pursue non-embryo-destructive sources of stem cells.

To the surprise of most observers, he did not impose any limitations on federal funds, leaving open the possibility that money could go not only to research that uses "spare" embryos from fertility clinics but also ones that create or clone embryos specifically for research purposes (but the president forcefully rejected cloning for reproductive purposes). He left all funding determinations to the discretion of scientists at the National Institutes for Health.

Obama justified the move as restoring "scientific integrity to government decision-making," but the chairman of the U.S. bishops' pro-life office, Philadelphia Cardinal Justin Rigali, called it instead a "sad victory of politics over science and ethics."

7 What does the Church teach on this issue?

In the 1998 encyclical letter *Fides et Ratio* ("Faith and Reason"), Pope John Paul II showed us that both faith and reason can be used to seek and find the truth. Such is the case with human embryonic stem cell research and cloning. Faith tells us it is wrong to take a human life; reason and knowledge of basic biology tell us that an embryo (whether cloned, obtained through in vitro fertilization, or naturally fertilized) is clearly a human life.

The Church has consistently taught that human life must be respected at its very origin: "Human life must be respected and protected absolutely from the moment of conception. From the first moment of his existence, a human being must be recognized as having the rights of a person — among which is the inviolable right of every innocent being to life" (*Catechism of the Catholic Church*, n. 2270; cf. Congregation for the Doctrine of the Faith, *Donum Vitae* I, 1 [see also I, 4-6]). In his 1995 encyclical *Evangelium Vitae* ("The Gospel of Life"), Pope John Paul II emphasized that "the direct and voluntary killing of an innocent human being is always gravely immoral" (n. 57; see also nn. 60, 63).

Some say that the good to be accomplished by healing diseases and injuries through the use of embryonic stem cells justifies the evil of destroying some human embryos.

However, this argument violates one of the most basic principles of morality: that one may not do evil to achieve good (see Romans 3:8; *Humanae Vitae* [on the regulation of birth, n. 14]; *Veritatis Splendor* ["The Splendor of Truth," nn. 71-82]). It also reduces people, specifically embryonic human beings, to their usefulness.

8 Why should Catholics be concerned?

Contemplating the vulnerability and weakness — and miracle — of the human embryo should make us pause in wonder and awe. We need to reflect on the gift of human life itself, and then everything about the issues of embryonic stem cell research and cloning becomes clear. One may not kill a human embryo for any reason. One may not view the human embryo, or its cells, in a utilitarian way. We have a responsibility to proclaim the truth about these issues.

Pope Benedict XVI's first encyclical, *Deus Caritas Est* ("God Is Love"), states, "The Christian's program — the program of the Good Samaritan, the program of Jesus — is 'a heart which sees.' This heart sees where love is needed and acts accordingly" (n. 31). The Christian heart sees the humanity in the embryo and acts accordingly to protect the most vulnerable of human life.

As faithful citizens of our nation, we have a right to have our voices heard. As faithful Catholics we have an obligation to speak up in defense of the dignity of human life. We must inform ourselves on these important issues, including on what the Church teaches about them and why. And contact your elected officials by phone, e-mail, letter, or personal visits.

Where to go for more information

Documents available at the Vatican website, www.vatican.va:

- *Dignitas Personae* ("The Dignity of the Person"), Sacred Congregation for the Doctrine of the Faith
- *Deus Caritas Est* ("God Is Love"), Pope Benedict XVI
- *Donum Vitae* ("The Gift of Life"), Sacred Congregation for the Doctrine of the Faith
- *Evangelium Vitae* ("The Gospel of Life"), Pope John Paul II
- *Fides et Ratio* ("Faith and Reason"), Pope John Paul II
- *Humanae Vitae* (On the Regulation of Birth), Pope Paul VI
- "Intervention by the Holy See Delegation at the Special Committee of the 57th General Assembly of the United Nations on Human Embryonic Cloning," Archbishop Renato R. Martino
- *Veritatis Splendor* ("The Splendor of Truth"), Pope John Paul II

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Do No Harm: The Coalition of Americans for Research Ethics, www.stemcellresearch.org

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WHAT THE CHURCH TEACHES

Human Stem Cell Research and Cloning

For it was you who formed my inward parts; you knit me together in my mother's womb. I praise you, for I am fearfully and wonderfully made. Wonderful are your works.

Psalm 139:13-14

Stem cell research has been promoted by scientists, doctors, and the media as one of the most important types of research today. It offers the promise of treating some of the most devastating diseases and injuries, including diabetes, leukemia, Parkinson's disease, Alzheimer's disease, heart disease, and brain and spinal cord injuries. Why, then, is the Catholic Church against certain types of stem cell research?

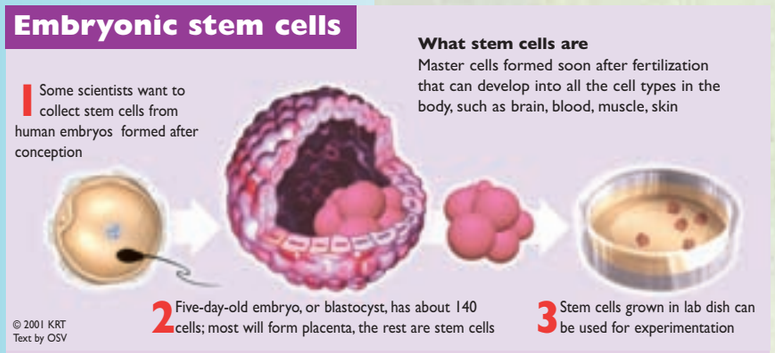
1 What are stem cells?

Stem cells are a unique type of undifferentiated cell, which have the flexibility to form other types of cells. There are two types of stem cells:

• **Adult stem cells** are found throughout the body (including the umbilical cord) and remain open to the capability to form many other types of cells, such as blood, liver, muscle, skin, nerve, and so on. They can differentiate into these other types of cells in order to replace or repair worn-out or damaged cells throughout one's life.

• **Embryonic stem cells** are cells within a developing embryo, which likewise can form almost any type of cell in the body, given the appropriate developmental growth factors and stimuli.

Embryonic stem cells



2 Is all stem cell research wrong?

No, certain types of stem cell research are morally licit (permitted) and certain types are immoral, depending on the way the cells are obtained. *Adult stem cell research* is morally licit, and many strides have been made in curing and treating people with these cells. *Embryonic stem cell research* is morally illicit (not permitted), because a human life is killed in obtaining these cells.

It must be emphasized that the Church is not against all forms of stem cell research. The Church opposes only those methods that involve the destruction of a human life, such as embryonic stem cell research.

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3 What are the moral concerns with embryonic stem cell research?

• Embryonic stem cells are obtained by taking a five- to seven-day-old human embryo and extracting the inner cell mass. These cells can then be cultured and given growth factors to grow into specific types of cells. If such an embryo — which already contains the entire genetic inheritance of the human being that it will become — does not have its inner cell mass extracted, it will grow and mature as usual (into a fetus, baby, child, and adult). Therefore, the extraction of these cells constitutes the taking of a human life, and the use of embryonic stem cells is ethically wrong.

• Embryos created in the process of in vitro fertilization are particularly vulnerable to being utilized for embryonic stem cell research, because there are usually more embryos created than are implanted in the mother. The remaining embryos are often frozen for possible later use. It has been suggested by many who are not concerned about the welfare of these frozen embryos that they are "excess" and should be used to obtain their cells for embryonic stem cell research. However, these embryos are living human beings, and it is not morally permitted to take their lives to obtain their cells.

4 What are the medical concerns with embryonic stem cell research?

• Embryonic stem cells are considered somewhat uncontrollable; it has been found that they form tumors in animal experiments.

• Scientists have found that gene expression in embryonic stem cells is extremely erratic and can differ widely from cell to cell. This could mean that if used in transplants, the cells could exhibit aberrant behavior due to cell variation in gene and protein expression.

• Embryonic stem cells exhibit the cellular markers of the original donor of the cells, which can cause an immune response in the recipient of the cells. Just as in normal organ transplants, in order to avoid graft-versus-host disease, the physician would need to treat the recipient with immunosuppressive drugs (which can involve undesirable patient side effects).

• One way that has been proposed to get over this immunosuppression problem is to "clone" a human embryo from a patient's own cells and then to "harvest" the embryo's cells for use in treating the patient (see box below). These cloned cells would be almost identical to the patient's cells, and theoretically would not cause immunological problems. However, the cloned embryo would still be a human embryo — a living human being in its earliest stages of formation — which would be intentionally killed in order to extract its embryonic stem cells.

What is cloning?

Cloning (also called somatic cell nuclear transfer) is the process of making an embryonic human being in the laboratory. The nucleus of a somatic (body) cell is transferred into a denucleated egg, and stimulated to divide and grow into a new human being.

Scientists speak today of the possibilities of cloning human beings for both "reproductive" and "therapeutic" purposes:

• "Reproductive" cloning: A cloned embryo is created and then implanted into a woman's womb, to bring it to birth. This is considered cloning to produce children. This illicitly moves human procreation out of the setting of marital intimacy and into the laboratory.

• "Therapeutic" cloning: A cloned embryo is created and instead of implanting it into a woman's womb, the embryo is killed in order to obtain its stem cells for research or therapeutic use. The assumption is that the cells can be retransplanted into the person from whom the clone is made (for the purposes of treating disease or injury), without immune rejection of the cells. This type of cloning is sometimes known as the "clone and kill" technique, since the embryo is killed during the procedure of harvesting its stem cells.

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In the end, they both really are the same thing: a human being is cloned. The only difference is what is done with the cloned human being. It is either allowed to grow, or is killed "for research or therapeutic purposes." So-called therapeutic cloning clearly is not "therapeutic" for the embryo, since it loses its life in the process.

Cloning is also imbued with a logic of production and is a highly utilitarian way of treating human beings. It uses them as literal "factories" for the production of their cells, without regard for their inherent dignity as persons. The Pontifical Academy for Life rejects cloning because it "denies the dignity of the person subjected to cloning and the dignity of human procreation." Additional casualties of the cloning process are women. In cloning, "women are radically exploited and reduced to a few of their purely biological functions (providing ova and womb)."

Numerous animals, including a sheep named Dolly and a dog named Snuppy, have been cloned. In the last few years, some laboratories have been trying to clone humans for "therapeutic use." Several private U.S. and European research laboratories continue to perform research attempting to clone human beings.