



Christian Reflection

A Series in Faith and Ethics

Focus Article:

📖 Cloning Facts and Fictions
(*Cloning*, pp. 21-28)

Suggested Article:

📖 Repeating Realities
(*Cloning*, pp. 58-59)

What do you think?

Was this study guide useful for your personal or group study? Please send your suggestions to:

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Christian Reflection

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Cloning Facts and Fictions

The heated debate over reproductive cloning, as well as therapeutic cloning to obtain embryonic stem cells, has been fueled by misconceptions and hyperbole on both sides. We need to separate the facts from the popular fictions about human cloning.

Prayer

Scripture Reading: Psalm 8

Responsive Reading: based on Psalm 119:64, 66

The earth, O LORD, is full of your steadfast love;
teach us your statutes.

Teach us good judgment and knowledge,
for we believe in your commandments.

Reflection

Psalm 8 boldly celebrates human beings' creative power and authority within the creation, proclaiming that we have been "crowned...with glory and honor" and "given...dominion over the works of [God's] hands," the creatures of the land and air and sea. Yet the psalm reminds us that our kingship is by *appointment*—our authority is derived and our glory is mirrored from the creator's. Appropriately, this song of celebration begins and ends with wonder and praise: "O LORD, our Sovereign, how majestic is your name in all the earth!"

What a rich view of our humanity is offered in this psalm! Our dignity, glory, and dominion are balanced with a keen awareness of our creatureliness and dependence on God's guidance. With this perspective in mind, let us consider the central issues that are raised about human identity by cloning.

"Two types of cloning are prevalent today in the biomedical sciences," James Marcum explains. *Reproductive cloning*, where an adult organism is duplicated to make a "delayed genetic" twin, raises issues for human identity like "Are we reducible simply to our genes, or are there dimensions of our existence not reducible to the genome?" In a second type of cloning, *therapeutic or research cloning*, a cloned embryo is dissected to obtain embryonic stem cells for medical treatment or research. This raises questions about the moral status of the blastocyst or embryo.

Since "the debate over human cloning involves a tremendous amount of hype," Marcum dispels three misconceptions:

- ▶ *Cloning is a simple process.* While easy to explain, it is difficult to achieve. The success rate for reproductive cloning is very small, and cloned organisms often die prematurely, suffer poor health, and have defective genes. "These problems may result from the enormous stress placed upon both the cell and nucleus during the cloning process," Marcum writes, or from asking the nucleus from "a specific somatic or adult cell, suddenly to direct the development of an embryo."

Since it's hard to control cellular growth, therapeutic cloning has a dismal success rate too. When embryonic stem cells are successfully harvested and placed in a patient, they often do not relieve the disease, or they may produce tumors or



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unwanted tissues. A final issue involves the supply of eggs; supplementing the human supply with eggs from other species, such as cow, raises technical problems of tissue rejection.

- ▶ *We can 'copy' a loved one.* No, for a clone will have the donor's genes, but a different appearance and personality. Many cellular factors control how an organism's genes are expressed. "Human personhood is not reducible to a genetic code," because we are shaped by historical, contingent relationships.
- ▶ *There is no viable medical alternative to embryonic stem cells.* There are options to creating and dissecting embryos, for "adult tissue from almost every organ in the body, umbilical cord blood, and the placenta contain stem cells...[that] may rival the pluripotency of embryonic stem cells." Adult stem cells, because they avoid the problems of embryonic cells, may be better suited for therapeutic purposes.

Study Questions

1. How are reproductive and therapeutic (or research) cloning similar? How are they different?
2. The success rate for cloning is very low. What factors in the early stages of human development make cloning so hard?
3. Therapeutic cloning to treat human disease on a commercial scale will require a large supply of eggs. What options are available? What ethical issues would each option raise?
4. Discuss Marcum's view that "In regard merely to protecting human identity, then, there is no reason in principle why humans should not be cloned." Why, then, does Marcum oppose human reproductive cloning?
5. What is your initial response to Joshua Smith's sculpture, *Found Wasp Nest* (on the cover and p. 58)? How does Smith deal with these central fears about human cloning: "Who or what exactly are we? Are we reducible simply to genes?"

Departing Hymn: "Immortal, Invisible, God Only Wise"

Immortal, invisible, God only wise,
in light inaccessible hid from our eyes,
most blessed, most glorious, the Ancient of Days,
Almighty, victorious, Thy great Name we praise.
Unresting, unchanging, and silent as light,
nor wanting, nor wasting, Thou rulest in might;
Thy justice, like mountains, high soaring above
Thy clouds, which are fountains of goodness and love.
To all, life Thou givest, to both great and small;
in all life Thou livest, the true life of all;
we blossom and flourish as leaves on the tree,
and wither and perish—but naught changeth Thee.
Great Father of glory, pure Father of light,
Thine angels adore Thee, all veiling their sight;
all praise we would render; O help us to see
'tis only the splendor of light hideth Thee!

Walter Chalmers Smith (1824-1908), alt.
Tune: ST. DENIO

Cloning Facts and Fictions

Lesson Plans

<i>Abridged Plan</i>	<i>Standard Plan</i>
Prayer	Prayer
Scripture Reading	Scripture Reading
Responsive Reading	Responsive Reading
Reflection (skim all)	Reflection (all sections)
Questions 1, 2, and 3	Questions (selected)

Teaching Goals

1. To understand the basic process of reproductive and therapeutic (or research) cloning.
2. To dispel some of the hype and baseless fears regarding human cloning.
3. To clarify the moral issues based on the technical difficulties and obstacles faced by human cloning.

Before the Group Meeting

Distribute copies of the study guide on pp. 4-5 and ask members to read the Bible passage in the guide. Distribute copies of *Cloning (Christian Reflection)* and ask members to read the focus article and suggested article before the group meeting. For the departing hymn “Immortal, Invisible, God Only Wise,” locate the tune ST. DENIO in your church’s hymnal or on the web at www.cyberhymnal.org.

Begin with a Comment

James Marcum describes the recent and quick advance of cloning technology: “Although animal cloning was first conducted successfully in the 1950s—the first animal cloned by nuclear transfer was a tadpole—biologists commonly held that mammals could not be cloned. They believed that the adult mammalian body cell’s nucleus is too specialized or differentiated to provide the genetic information needed to direct an organism’s development. That is, the information necessary to guide an organism’s growth is locked up too securely to be accessed or, simply stated, the cell’s nucleus is just too old to be born anew. Of course, that position changed with the cloning of the sheep ‘Dolly,’ who was born on July 5, 1996. Since then other mammalian species, such as cows, pigs, mice, and cats, have been cloned successfully. Some biologists believe it is only a matter of time until humans are cloned” (*Cloning*, pp. 21-22).

Prayer

Invite members to share their personal celebrations and concerns with the group. Provide time for each person to pray silently. Conclude by praying that as members grapple with the challenging issues of cloning, God will lead them to understanding.

Scripture Reading

Ask a group member to read Psalm 8 from a modern translation.

Responsive Reading

The leader begins and the group reads the lines in bold print.

Reflection

In this study James Marcum briefly explains the two types of cloning—reproductive and therapeutic (or research) cloning—and the basic technology, called somatic cell nuclear transfer, that they share. He also introduces the terminology used to describe the early stages of human embryonic development. Take time to review this information and answer members’ questions. Understanding these key facts about cloning and human development will help members resist the hype and dispel the myths coming from all sides of the debate about human cloning.

Psalm 8 beautifully balances two dimensions of our humanity. On the one hand, God gives us dominion over many aspects of the creation, and this authorizes our developing genetic knowledge and power.

Yet we exercise our dominion under the majestic lordship of the creator, and this places limits on how we develop genetic knowledge and use its power. Psalm 119 views these limits—God’s statutes and commandments—as reflecting God’s steadfast love for the world and as guiding us toward developing good judgment and knowledge. We fully express our humanity not when we discover everything we can and do anything we want, but when we develop our knowledge and exercise our dominion with good judgment, with love that echoes God’s love for the world.

Encourage the group to discuss Marcum’s responses to three common misconceptions about human cloning: (1) the process of cloning is not only conceptually simple, but it is easy to use and to achieve satisfactory results; (2) we can “copy” individuals because a clone will be identical to its donor; and (3) there are no promising medical alternatives to therapeutic (or research) cloning in order to harvest pluripotent stem cells.

Study Questions

1. All cloning shares a technology called somatic cell nuclear transfer. After the nucleus is removed from an egg, another donor nucleus—generally from an adult body cell—is transferred to the enucleated egg. The reconstituted egg is stimulated by a specific chemical or an electric shock, placed in an artificial environment, and then stimulated by other chemicals that promote growth and cell differentiation.
In reproductive cloning the embryo is placed into a womb and brought to birth as a clone, which is usually called a “delayed genetic” or “spaced” twin. In therapeutic cloning, the embryo is maintained in the artificial environment for several days until it reaches the blastula stage, after which it is dissected for the embryonic stem cells.
2. “Cloning today is more art than science,” Marcum says. “Success often depends more on the tacit skills of the investigator, like riding a bike, than on the techniques employed. We understand little about the processes involved in the development of an organism, and without an answer sheet on the subject we cannot gauge our progress in mastering those processes.” Problems occur at each stage of the delicate procedure: (1) in removing the nucleus from the egg, substances that direct the early stages of development may be inadvertently removed; (2) the donor nucleus, which is taken from an adult cell, may not switch over to its new task of directing the egg’s development; (3) (in therapeutic cloning) chemicals in the artificial environment may not stimulate the embryo properly, resulting in damaged genomes or differentiation into the wrong kinds of cells; and (4) (in therapeutic cloning) the organism into which the harvested stem cells are placed may reject them as “foreign” tissue. Some researchers hope that using adult stem cells from the patient will resolve the last problem.
3. Eggs might be harvested from humans for other species, such as cow. Using human eggs raises issues such as the health risks to the donor, the probability that poor women will be tempted to sell eggs to researchers, and that the price will be high because of the limited supply. The use of non-human eggs raises issues involving the generation of hybrid-species organisms, and the added risk of patient’s rejection of the stem cells.
4. Marcum says it is hype to think humans can be “copied.” He is concerned about the high risk of unfortunate results in clones, and the terrible destruction of many embryos, which are much “more than a ball of cells.” He also mentions the “reduction in genetic variability in the human population, if reproductive cloning were conducted on a grand scale.”
5. “[Smith] plays with ideas in his sculpture and expects his audience to do the same,” Hornik reports. This sculpture leads some viewers to think of abortion in connection with cloning, of how they feel about being identified by numbers, or of society’s interest in faux objects.

Departing Hymn

If you choose not to sing the hymn, you may read the hymn text in unison, or silently and meditatively as a prayer.