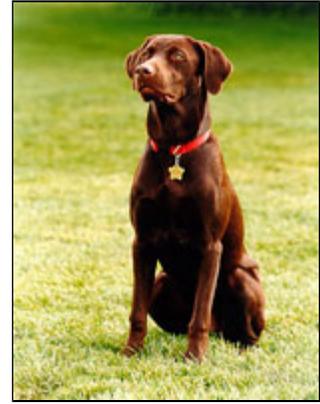




CASE TEACHING NOTES for "Cloning Man's Best Friend"

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INTRODUCTION / BACKGROUND

This case was written for a high school introductory biology class. The purpose of the case is to provide students with an opportunity to discuss animal cloning and its moral implications. It was designed to be given to students at the conclusion of a unit on genetics in which cloning has been thoroughly discussed. The case makes use of a debate format. Students read the case, in which a family pet has died, and assume the roles of the family members who must distinguish between conflicting opinions as to whether or not the animal should be cloned. In order to minimize disruption to other classrooms and teachers, the author recommends that the case be conducted in the school auditorium. As developed, the case requires two 40-minute class periods, ideally run back to back. In preparation for the case, students will need detailed prior knowledge regarding the topic of cloning, including what genetic cloning is and what it involves.

Objectives

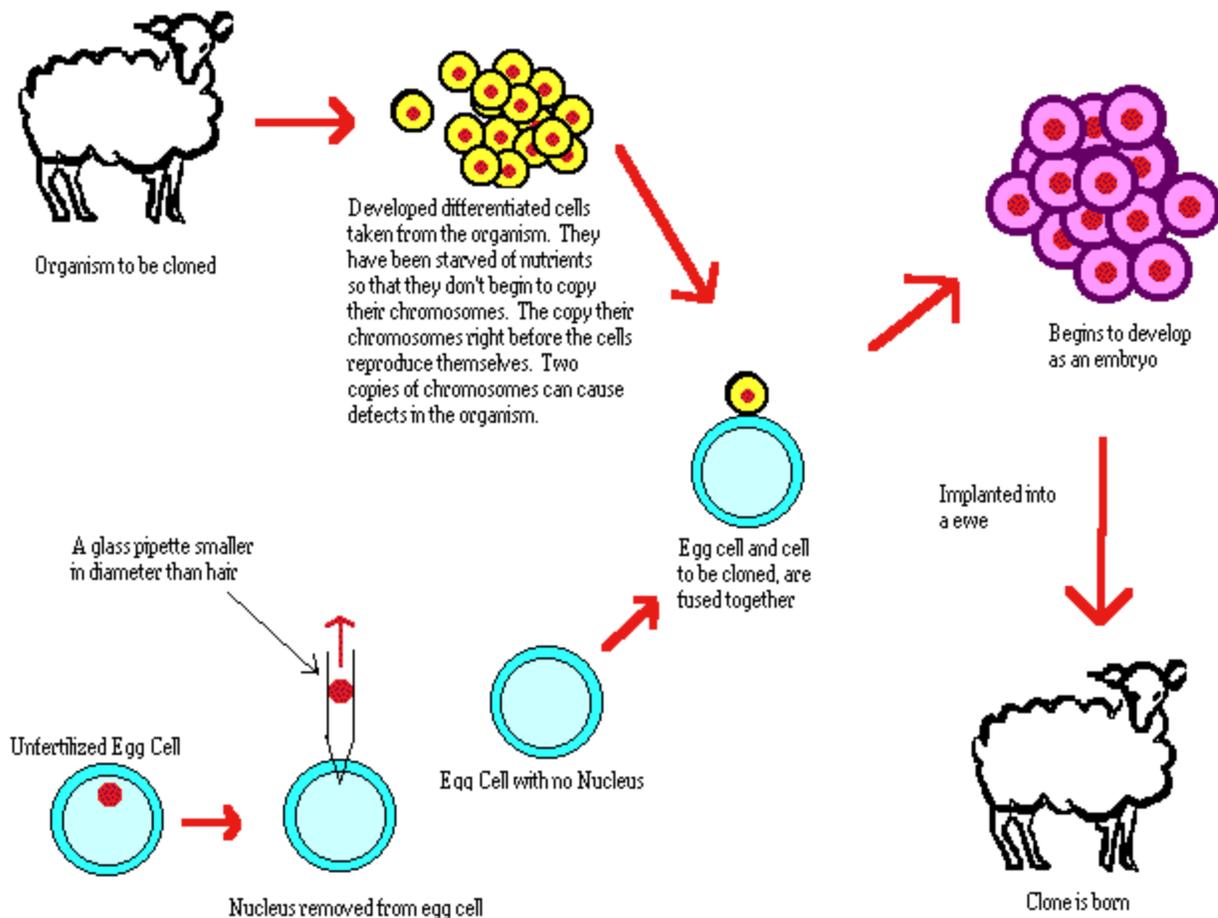
- Provide a discussion of the moral issues involved in animal cloning.
- Allow the students to interact in a debate session.
- Discuss the pros and cons of cloning.
- Discuss the advantages and the disadvantages of the cloning process.
- Clear up any misconceptions regarding the process of cloning.

BLOCKS OF ANALYSIS

Nuclear Transfer

One type of cloning that has been in the news is called nuclear transfer. This is the process where the **nuclear material** from an **oocyte** or a female sex cell is removed and a **somatic cell's** or **body cell's** nucleus is inserted in to the egg cell.

The newly formed zygote has the potential to divide into a **blastocyst**, and, if implanted, the zygote will form into a genetic copy of the organism that the somatic cell's nucleus came from. The objective for this procedure is to create genetic copies of individuals of certain species. The process is outlined in the diagram below.



Pros and Cons of Cloning

PROS:

- Produce animals with desirable traits.
- Increase the efficiency of the livestock production.
- Offset losses of among endangered species populations.
- Enable better research for finding cures to many diseases.
- Provide children for parents who would like a child but can't have one for various reasons.
- Provide parents with an opportunity to clone a child who has died.

CONS:

- Decline in genetic diversity.
- Taking nature into our own hands.
- Religious and moral reasons.
- Physical problems, such as birth defects.
- Possibility of mental and emotional problems of the clone.

More detailed information about the process and the ethical issues involved in cloning is available in the teaching notes for another case on this website. See the [Case Teaching Notes for "Bringing Back Baby Jason: To Clone or Not to Clone?"](#) A good web resource ("Cloning—A Webliography") that provides an overview of animal cloning and links to articles, books, ethical statements, companies, professional societies, and other websites is available at <http://www.lib.msu.edu/skendall/cloning/>.

CLASSROOM MANAGEMENT

The instructor should take about 10 to 15 minutes reviewing the material that the students will have already covered on cloning in preparation for the case. The following opening questions may be asked: "What is genetic cloning? What does genetic cloning involve?"

After a short discussion, divide the class into four equal groups of between four and six students. One group of students will represent Spot, the second group will represent Jack, the third group will represent Grace, and the fourth group, Ralphy. While assigning the groups, the students shouldn't be told who they represent.

The two groups representing Ralphy and Grace should congregate in two different corners in the front of the auditorium so that they are separated from one another, while the two groups representing Spot and Jack should be sent to the back two corners of the auditorium.

After the groups have been separated, hand out the case to the groups designated as Ralphy and Grace (it is at this point that the teacher tells the students their roles). Allow the students in the two groups representing Ralphy and Grace to read through the case while instructions are being given to Jack and Spot.

Tell the Ralphy and Grace groups they must list the pros and cons of cloning and discuss the reasons why they are for cloning or not for cloning. Allow 15 minutes for this. The students should write their answers with a felt tip pen on a large piece of newsprint or flip chart paper so that all of the students in the class will be able to read their responses. Make sure to impress upon the students that they will be playing the role of either Grace or Ralphy and should express the viewpoints of the characters and not their own.

Meanwhile, give the students in the group representing Jack instructions that they are to discuss the following questions and try to come to some consensus on them:

- How might cloning increase the quality of society, family, and overall life?
- How might it not?
- What is the likelihood that cloning will be allowed in the U.S. and why?

Hand the case out to the students in the group representing Spot and explain to them their role. They are to discuss among themselves how they feel about being cloned. Explain to them that Jack will have to make a decision about this and that they will need to explain their position clearly to the other members of the class and provide good reasons for their position.

If there are other members in the class who are not involved in the case, provide handouts of the case to them. Have them turn to their neighbors and discuss what they think the key questions are that must be answered in order for the family to make a reasonable decision.

Bring all of the groups back into the room. The following sequence represents one way of structuring the debate.

1. Have the group that represents Jack discuss the questions they have been working on.
2. Then have the groups representing Grace and Ralphy state their case trying to persuade Jack to accept one of their respective views.
3. Next introduce the Spot group to present his worries and concerns.
4. Follow this with a general discussion about the problem of cloning, being sure to address any general questions from the student audience.
5. Finally, have the group that represents Jack have a quick discussion to make a decision whether to clone or not based on the arguments that have been presented.

6. In closing, go over the cloning process used to produce the cloned sheep Dolly in order to clarify any misconceptions of the cloning process.

REFERENCES

- Dolly Diagram
<http://www.vuhs.org/apbio/clone/dolly.htm>
- Pros and Cons
<http://www.webdesk.com/pros-and-cons-of-human-cloning/>

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