

# Stem Cell Research

## Two Pathways For A Cure?



### Goal of Activity:

The goal of this activity/exercise is to have students understand the differences between two types of stem cell research and understand the potential impact that each type of research has on improving the quality of human life. In addition, students will consider the complexities and issues surrounding stem cell research by thinking about it on a personal level first, and then extrapolating their thoughts about the issues to make a decision or state a final opinion based upon selected research and the knowledge acquired from various sources.

### Desired Outcomes:

Students will be able to:

1. Know the characteristics that distinguish stem cells from other types of cells
2. Describe the advantages and disadvantages of embryonic and adult stem cell research and the impact those advantages have on humanitarian and scientific efforts
3. Know how stem cells are derived
4. Understand the scientific, humanitarian, and economic importance of stem cell research

### Procedure:

1. Introduce the goal of the activity to the students and briefly discuss the importance of investigation and experimentation.
2. Ask students what they have heard about genetically modified organisms and have them discuss/list the sources of their information.
3. Review the Societal Statement by having one student read it aloud.
4. Review the Key Terms with students.
5. In order to get the students to make informed decisions based upon facts, ask them if they are concerned about world hunger, water usage, the dangers of agricultural run-off/pesticide use, and effective disease treatment. Record where students stand on these issues and note whether the students believe if the stated problem is a top priority to alleviate or solve in their opinion.
6. Find out what the students know about genetically modified organisms. Ask them whether they are pro or con on the topic. Record the students' positions.

7. Assign each student the task of finding two articles on Google about genetically modified organisms. (The California Society for Biomedical Research and the National Institutes of Health are two sources for articles). This is also a good opportunity to discuss the importance of obtaining information on the internet from reliable sources.
8. Divide the class into sections and assign one or two key terms to each group to define and report back to the class.
9. After researching definitions, have the students read the definitions assigned to them out loud.
10. Have the students read each of the student questions and allow students to respond to the each question. Allow the students to express the pros and cons of their argument.
11. Ask whether any students have changed their minds regarding their opinion concerning the use of genetically modified organisms. If they have changed their opinion, ask the students what made them switch their position.

### Societal Statement:

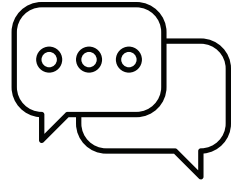
Stem cell research represents one of the most promising forms of medical research. It holds the potential to cure everything from diabetes to Parkinson's disease to Alzheimer's. There are ethical concerns and conflict, however, among members of the public about the nature and form of the process of stem cell research. Researchers are still attempting to define the limits of stem cell research, which appears to have almost infinite applications, while society addresses these ethical concerns.

### Key Terms:

- Embryonic stem cells
- Trophoblast
- Culture medium
- Blastocyst
- In vitro
- Cell differentiation
- Adult stem cells
- Cell culture
- Stem cell line

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## *Two Pathways For A Cure?*



1. How does it feel to have an elected official not listen to you? Or not vote in accordance with your wishes/or the wishes of the majority?
2. Do you think you could stand behind something that you are opposed to? Why or why not?
3. Has your position regarding stem cell research changed? Why or why not?
4. If your relative could receive life saving treatment or an improved quality of life as a result of embryonic stem cell research, would you change your position?
5. If the research showed that a cure for your relative's disease/illness could be developed ten years earlier if embryonic stem cells are used, would your position change?
6. How did it feel to know that a potential cure for your relative may not be investigated due to perceived moral or ethical reasons?
7. What, if anything, swayed you to change your mind regarding stem cell research?
8. What affect do you think another country using embryonic stem cell research to cure diseases like Parkinson's or eliminate partial paralysis would have on the U.S. research community? Or health care in the U.S.?
9. Is it important for U.S. researchers to investigate all potential sources of treatment? Why or why not?