Lesson 5 Ethics and Policy

Objectives

Students will be able to:

- Identify ethical issues around policy and use of stem cells.
- Compare and contrast opposing views with respect to the ethics of embryonic stem cell research.
- Engage in a discussion of the ethical and policy issues surrounding stem cell research.

Class Time

Approximately 75 minutes; if the articles are read for homework, class time would be decreased by 15-20 minutes.

Prior Knowledge Needed

- A basic understanding of stem cell types and potencies, as well as the techniques for using stem cells.
- An understanding of the ethical perspectives.
- How to have a classroom discussion in a way that is respectful of others.

Common Misconceptions:

- Privately funded stem cell research is federally regulated.

Introduction

This lesson provides students with the opportunity to become familiar with the history of federal policy and regulation with respect to embryonic stem cell research, and the ethical debate which has shaped this policy. Students discuss issues regarding private and public funding, and the implications for treatment of disease and advancement of scientific knowledge.

Students read articles with opposing viewpoints surrounding the ethics of embryonic stem cell research. The class then participates in a **Socratic Seminar Fishbowl Discussion**. This activity provides students with the opportunity to have a structured discussion and achieve a deeper understanding about the ideas and values in the articles.

Students use a "Critical Reasoning Analysis Form" to examine the articles and create a set of open-ended questions about public policy and embryonic stem cell research.

Key Concepts

- Federal regulations apply only to research institutes that receive federal funding.
- Private research institutes and companies are virtually unregulated by the federal government.
- The national debate over embryonic stem cell research policy is shaped by issues of faith, politics, values and science.

Materials

Student Handouts:

- 5.1 – *Key moments in the Stem Cell Debate*
- 5.2 – *Opposing Views: Arguing FOR Embryonic Stem Cell Research*
- 5.3 – *Opposing Views: Arguing AGAINST Embryonic Stem Cell Research*
- 5.4 – *Critical Reasoning Analysis Form*
- 5.5 – *Open-Ended Questions for a Socratic Seminar*
- 5.6 – *Socratic Seminar Fishbowl Discussion Partner Evaluation* (optional adaptation)

Teacher Background

- —Socratic Seminar Assessment Rubric
- —Private vs. Public Funding for Stem Cell Research

As an option to the Opposing Views essays, students can read a letter from eighty Nobel laureates in support of embryonic stem cell research and President George W. Bush's 2001 policy-defining speech regulating embryonic stem cell research. These documents can be found at the end of this lesson.

The Opposing Views essays can be found at:
http://www.npr.org/takingissue/takingissue_stemcells.html

A more complete timeline, up to 2007, can be found at:
http://www.npr.org/templates/story/story.php?storyId=5252449

Additional information about the purpose, structure and key elements of a Socratic Seminar can be found in An Ethics Primer, available at:
http://nwabr.org/education/ethicslessons.html#PR

Background on Federal Policies and Regulations

Many students ask, "**Is embryonic stem cell research legal?**" The answer is, "Yes." The derivation of new stem cell lines and work with existing lines has always been legal, even under President Bush's restrictive policies. Federal law does not prevent research using embryonic stem cells. Federal law can, however, strictly enforce the use of federal funds. Most research institutions and public universities receive grants from the federal government to support their research. If federal funds (money from taxpayers) are not allowed to be spent on certain types of research, the institutions either have to forgo the research, or find ways to fund it outside of the federal government.

Reinforce that federal funding restrictions only apply to research institutions that receive money from the federal government.

There are virtually no restrictions on the kind of stem-cell research that may be done with private money.

Also note that individual states have created sources of money to fund embryonic stem cell research without relying on federal funds. In 2004, California voters passed Proposition 71 which approved $350 million annually for embryonic stem cell research. In 2007, California spent more than the federal government and many other nations on human embryonic stem cell research. Students can become familiar with the history of embryonic stem cell research in the U.S. by reading *Key moments in the Stem Cell Debate* (Handout 5.1).

Background on the Socratic Seminar

"A Socratic discussion is a text-based discussion in which an individual sets their own interpretations of the text alongside those of other participants. The aim is a mutual search for a clearer, wider and deeper ('enlarged') understanding of the ideas, issues, and values in the test at hand. It is shared inquiry, not debate; there is no opponent save the perplexity all persons face when they try to understand something that is both difficult and important."

— *Walter Parker, PhD, University of Washington*

In a Socratic Seminar Discussion, the participants carry the burden of responsibility for the quality of the discussion. Good discussions occur when participants study the text closely in advance, listen actively, share their ideas and questions in response to the ideas and questions of others, and search for evidence in the text to support their ideas. The discussion is not about right answers; it is not a debate. Students are encouraged to think out loud and to exchange ideas openly while examining ideas in a rigorous, thoughtful manner.

In a Socratic seminar, there are several basic elements:

- A text containing important and powerful ideas (it could be an article, film clip, etc.) that is shared by all participants. It is helpful to number the paragraphs in a text so that participants can easily refer to passages.
- A distinctive classroom environment; seating students in a circle and using name cards helps to facilitate discussion. The students should have a clear understanding of the discussion norms, which should be prominently posted.

- An opening question that requires interpretation of the text and is genuine (one where there is not an easy, predetermined answer). For example, 'What is the most important passage?' or 'What is the author driving at in the text? Recommended questions can be found in the Procedure section.

Procedure

Before the Socratic Seminar

1. Introduce the seminar and its purpose (to facilitate a deeper understanding of the ideas and values in the text through shared discussion).
2. Have students read the articles from Student Handouts 5.2 and 5.3 with opposing viewpoints. It is important that every student reads the text, since the quality of the discussion depends on contributions from each participant. It may be helpful to allow time in class for students to read the articles.
3. Students may use one of several formats to process the information. The Critical Reasoning Analysis Sheet (Handout 5.4) and/or the Open-Ended Questions (Handout 5.5) can be used to help students understand the content. If students have been given the reading as homework, the completed handouts can be used as the 'ticket' to participate in the seminar. Some teachers give students the guiding question (described below) for them to consider as they read the text.
4. In addition to the classroom discussion norms you may have already set, it is important to include the following norms:
   - Don't raise hands
   - Listen carefully
   - Address one another respectfully
   - Base any opinions on the text

During the Socratic Seminar Fishbowl Discussion

1. To create the discussion groups, divide the class in half and form two circles (an inner circle and an outer circle). The inner circle is engaged in the discussion, and the students in the outer circle are listening to the inner circle discussion. Students in the outer circle take notes and write down ideas or comments on what they hear in the inner circle discussion. After approximately 10 minutes (or another appropriate time period) the circles flip so that students in the inner circle and outer circle trade places. Teachers can use Student Handout 5.6 to help focus students during the discussion, if needed (see "adaptations.")
2. Teachers may choose to have the inner circle complete a Socratic seminar using only one of the articles (either the FOR or the AGAINST Embryonic Stem Cell Research argument). When the inner and outer circle trade places, a new Socratic seminar can begin with the second article, using the same guiding question.

3. To begin the discussion, the teacher/facilitator may pose the guiding question(s) or the participants may agree upon questions to begin the discussion.

   Recommended guiding questions:

   - What values are most important to each author, based on his or her viewpoint and position?
   - Which ethical principles (respect, beneficience/nonmaleficience, justice) does each author rely on to support his or her reasoning?
   - In what way would the underlying values of each author guide future federal policy?

   Additional questions could include:

   - What, according to the authors, does this research mean?
   - What are the implications of each text?
   - What is the most important sentence in each article?

   Sample questions to move the discussion along:

   - Where do you find evidence for that in the text?
   - Who has not yet had a chance to speak?
   - Is there something in the text that is unclear to you?

4. If students completed sheet 5.5, many of these questions generated could be used as guiding questions for the discussion.

   1. The teacher can choose to facilitate the discussion by asking clarifying questions, summarizing comments, and highlighting understandings and misunderstandings. Teachers can restate the opening question if the conversation gets off track, or ask for different ideas if it stalls.
   2. Later on in the discussion, questions that refer to the experiences of the students and their own judgments can also be used. For example, 'Is it right that….?' or 'Do you agree with the author?' or 'Has anyone changed his or her mind?' These do not require reference to the text to be answered.

After the Seminar

1. Ask everyone questions such as:

   "Do you feel like you understand the texts at a deeper level?" and,

   "What was one thing you noticed about the seminar?"

2. Share your experience with the seminar as a facilitator.

Based on materials shared by Walter Parker, PhD, University of Washington, Paula Fraser, Bellevue PRISM program, Bellevue, WA, Jodie Mathwig and Dianne Massey, Kent Meridian High School, Kent, WA. We also gratefully acknowledge the influence of the Coalition of Essential Schools and the National Paideia Center.

Homework

Before the lesson, students can read *Key Moments in the Stem Cell Debate* (Handout 5.1) and the opposing essays (Handouts 5.2 and 5.3) as homework. Because the quality of the discussion is dependent on the students having read the essays, some teachers also give out *The Critical Reasoning Analysis Form* (Handout 5.4) and/or the *Open-Ended Questions* (Handout 5.5) for student to complete as they read the essays. The completed analysis sheets can be used as a 'ticket' to participate in the seminar.

After the lesson, students may wish to express their own opinions about embryonic stem cell research. Students can be assigned a short essay in which they detail their own views and beliefs on the subject and tie these beliefs back to one or more of the ethical perspectives they have studied.

The *Critical Reasoning Analysis Form* (Handout 5.4) can also be used as homework after the seminar.

Extensions

Students can investigate embryonic stem cell research policy in different states and countries, and discuss the similarities, differences, and implications for scientists/ scientific advancement.

Adaptations

To help engage students in the Socratic Seminar Fishbowl discussion you can have them evaluate another student's participation behaviors. This can be done by pairing each student in the inner circle with a student in the outer circle, or using Student Handout 5.6 to help students evaluate each other.

Assessment Suggestions

The students' Critical Reasoning Analysis Forms can be used as formative assessment to prepare for the Socratic Seminar.

The teacher may choose to require students to make a specific number of meaningful contributions to the discussion (for example – requiring the student to contribute 3 times to the discussion).

The teacher may choose to evaluate students in the discussion using the Rubric for Evaluating Classroom Discussions, found in the Appendix of this curriculum.

Sources

http://www.npr.org/takingissue/takingissue_stemcells.html

http://www.npr.org/templates/story/story.php?storyId=5252449

http://nwabr.org/education/ethicslessons.html#PR

http://newsroom.stemcells.wisc.edu/

Student Handout 5.1

Name _____ *Date* _____ *Period* _____

Key Moments in the Stem Cell Debate

The first embryonic stem cells were isolated in mice in 1981. But it wasn't until 1998 that researchers managed to derive stem cells from human embryos. That kicked into full gear an ethical debate that continues to this day. Here's a look at key moments in the controversy so far:

1981: Embryonic stem cells are first isolated in mice

1995: Researchers isolate the first embryonic stem cells in primates — rhesus macaque monkeys. The research shows it's possible to derive embryonic stem cells from primates, including humans.

1996: The first cloned animal, Dolly the sheep, is born in Scotland.

1998: Researchers report isolating human embryonic stem cells. The cells have the potential to become any type of cell in the body and might one day be used to replace damaged or cancerous cells. But the process is controversial: One team derived their stem cells from the tissue of aborted fetuses; the other from embryos created in the laboratory for couples seeking to get pregnant by *in vitro* fertilization.

2000: The National Institutes of Health issue guidelines that allow federal funding of embryonic stem-cell research. Former President Bill Clinton supports the guidelines.

February 2001: The month after taking office, President George W. Bush puts a hold on federal funds for stem-cell research.

August, 2001: President Bush announces his decision to limit funding to a few dozen lines of embryonic stem cells in existence at that date. Many of the approved lines later prove to be contaminated, and some contain genetic mutations, making them unsuitable for research.

November, 2001: Scientists at a private company in Massachusetts which receives no federal funding, claim to have cloned a human embryo. However, the evidence proves controversial and not conclusive.

February, 2004: South Korean scientists led by Hwang Woo-suk, announce the world's first successfully cloned human embryo using therapeutic cloning (SCNT) techniques. Unlike other past cloning claims, the scientists report their work in a prestigious, peer-reviewed journal, *Science.* The embryos were cloned not for reproductive purposes but as a source of stem cells.

September, 2005: Scientists in California report that injecting human neural stem cells appeared to repair spinal cords in mice. The therapy helped partially paralyzed mice walk again.

January, 2006: The Seoul National University investigation concludes that Hwang Woo-suk's 2004 landmark paper published in *Science* (see Feb. 12, 2004) was fabricated. He is later charged with fraud, embezzlement and violating the country's laws on bioethics.

July 2006: The Senate considers a bill that expands federal funding of embryonic stem-cell research. Among Senate sponsors of the bill are two prominent Republicans, Sen. Arlen Specter of Pennsylvania and Sen. Orrin Hatch of Utah.

July, 2006: President Bush vetoes the bill — the first use of his veto power in his presidency.

OVER

January, 2007: The House of Representatives is expected to pass a bill that would expand federal funding for embryonic stem-cell research, but the bill won't carry enough votes to override a threatened presidential veto.

April, 2007: Again, the Senate passes a bill that would expand federal funding for embryonic stem-cell research. The bill passes 63-34, just shy of the two-thirds majority needed to protect the legislation from President Bush's promised veto.

June, 2007: Researchers succeed in modifying a skin cell so that it behaves like an embryonic stem cell using iPS techniques. This eases some ethical concerns since it does not require the destruction of an embryo.

June, 2007: The House approves legislation to ease restrictions on federally funded embryonic stem-cell research. The bill would authorize federal support for research on stem cells from spare embryos that fertility clinics would otherwise discard. But the House is still 35 votes short of what it needs to override a presidential veto.

June, 2007: President Bush vetoes legislation that would have eased restraints on stem-cell research. This marks the second time the president has used his veto power against federally funded embryonic stem-cell research.

November, 2007: Scientists for the first time successfully clone embryos from the cells of an adult monkey and derive stem cells from those cloned embryos using therapeutic cloning (SCNT) techniques.

November, 2007: Two independent teams of scientists report on a method for making induced pluripotent stem cells (iPS) without destroying a human embryo. The researchers caution there are many steps before these cells are useful for human therapies but the work is being hailed as a critical step forward, both scientifically and ethically.

November, 2008: Barack Obama, a supporter of embryonic stem cell research, is elected President of the U.S.

February, 2009: Researchers create induced pluripotent stem (iPS)cells without using problematic retroviruses to insert the master regulator genes.

March, 2009: President Obama issues an executive order to remove barriers to responsible scientific research involving human stem cells.

July, 2009: The National Institutes of Health issue guidelines that detail how federal funds can be used for embryonic stem cell research.

During the time period when federal funding for stem cell research is more limited (between 2001 and 2008) New Jersey, California, Connecticut, Illinois, Florida, Maryland, Missouri and Iowa all find ways to fund embryonic stem cell research within the states' budgets, without relying on federal funds.

Reporting by Maria Godoy, Joe Palca and Beth Novey.

Source:
http://www.npr.org/templates/story/story.php?storyId=5252449
http://www.nature.com/news/2009/090227/full/458019a.html

Name _____ Date _____ Period _____

Opposing Views: Arguing FOR Embryonic Stem Cell Research

What Does it Mean to Be Human? *Laurie Zoloth*

Laurie Zoloth is a professor of medical ethics and humanities and of religion at Northwestern University. She is the past president of the American Society for Bioethics and Humanities.

November 22, 2005 — Of all the mysteries that surprise and delight us, surely the process by which a human being is created is the most ordinary and the most mesmerizing. In the last three decades, this process has also raised ethical questions that have defined and divided Americans: When does human life begin? What does it mean to be human?

Our answers to these questions shape the debate over the use of human embryonic stem cells to understand and hopefully to cure human diseases. If life begins at the instant of conception, then any act to end that life would be wrongful killing. But if human life is a contingent matter, a slow and complex process that unfolds temporally, physically and spiritually — as I believe — then it is possible to speak of times and manners and reasons why other moral appeals may matter more.

We are more than our DNA maps, for we are our love, our chance for duty. Careful use of the human blastocyst may be seen as a basic human duty in the face of significant suffering. These are the reasons why people of the deepest faith all over the globe support and defend stem cell research.

For most of human history, pregnancy was understood as prelude. Life was understood to begin in stages, the most important one being the birth itself, when a person becomes fully human, accepting the blessing of human family and community and attaining moral status for the Greek philosophers such as Aristotle.

For the writers of the first texts and laws of Western religions — Christian, Jewish and Muslim — pregnancy became actual when it was tangible, visible or palpable to the outside world. For them, the soul — God's participation in human beings — needed a form.

It was only after microscopes could reveal egg and sperm that such a concept as "life begins at conception" could alter theological and legal traditions, and in part, this is why the Vatican changed its idea about when life began. Prior to the mid-1800s, the Roman Catholic tradition, like Jewish and Muslim law, followed the science of Aristotle — that the first 40 days after conception was "formless" or "like water." Catholic canon law changed to reflect this new policy and the new science in 1917.

We know now that much has to occur for fertilization to take place. The egg must be released, it must accept the sperm, the cell wall and the nuclear wall have to be breached, the DNA correctly assembled. Even more has to occur before we can claim a woman is pregnant: The fertilized egg — a blastocyst — must maneuver the fallopian tube, get to the womb and be implanted. Only then can a pregnancy test confirm the event.

All along the way to birth, there are critical biological events, a universe of chance and contingency. That is why we greet each child as a miracle. That is also why we question the fate of the hundreds of thousands of human blastocysts created to treat infertility and then left in labs around the world.

Beyond the question of life's biological beginning, we need also to decide when our moral obligations to others begin — in this case, to others who suffer and whose own lives are at stake.

As a society, in our treatment of infertility, we have already made the decision that it is just and right to treat serious disease by researching and then creating human blastocysts. We allow physicians to experiment on human sperm and human eggs to find the best way to make blastocysts, to make far more than the couple will be able to use, to implant them knowing that only one or two can be carried to term.

We have been making blastocysts in the lab for more than two decades, knowing that most will be destroyed routinely. At stake is whether we can use blastocysts made in this way to treat other diseases, like diabetes, Parkinson's or spinal cord injury by using them to make stem cells.

We have our duties toward all of life, to be certain. We have duties toward the uncertain microscopic world, duties toward the blastocysts we create. But we have duties as well toward the millions of patients who might be cured by regenerative medicine, just as we did toward infertile women.

It is the strong belief in many religious and philosophic traditions that the ethical appeal for healing the suffering neighbor is far more important than the appeal for the blastocyst.

Source: **http://www.npr.org/takingissue/takingissue_stemcells.html**

Name _____ Date _____ Period _____

Opposing Views: Arguing AGAINST Embryonic Stem Cell Research

A Distinct Human Organism *Robert P. George*

Robert P. George is a former member of the President's Council on Bioethics. He is also a professor of jurisprudence and director of the James Madison Program in American Ideals and Institutions at Princeton University.

November 22, 2005 — The key question in the debate over stem cell research that involves the destruction of human embryos is: When does the life of a human being begin? To answer this question is to decide whether human embryos are, in fact, human beings and, as such, possessors of inherent human dignity.

Where do we go to find the answer? Not, in my opinion, to the Bible, Talmud or other religious writings, even if we regard these texts as sources of moral wisdom and even divine revelation. Nor should we be satisfied to consult our "moral intuitions."

Rather, the answer is to be found in the works of modern human embryology and developmental biology. In these texts, we find little or nothing in the way of scientific uncertainty: "…human development begins at fertilization…" write embryologists Keith Moore and T.V. N. Persaud in *The Developing Human* (7th edition, 2003), the most widely used textbook on human embryology.

A human embryo is a whole living member of the species *Homo sapiens* in the earliest stage of development. Unless severely damaged or deprived of nutrition or a suitable environment, the embryonic human will develop himself or herself by an internally directed process to the next more mature developmental stage, i.e., the fetal stage.

The embryonic, fetal, infant, child and adolescent stages are *stages of development* of a determinate and enduring entity — a human being — who comes into existence as a zygote and develops by a gradual and gapless process into adulthood many years later.

Whether produced by fertilization or cloning, the human embryo is a complete and distinct human organism possessing all of the genetic material needed to inform and organize its growth, as well as an active disposition to develop itself using that information. The direction of its growth *is not extrinsically determined*, but is in accord with the genetic information within it.

The human embryo is not something different in kind from a human being, nor is it merely a "potential human being," whatever that might mean. Rather the human embryo is a human being in the embryonic stage.

The adult that is you is the same human being who, at an earlier stage of your life, was an adolescent, and before that a child, an infant, a fetus and an embryo. Even in the embryonic stage, you were a whole, living member of the species *Homo sapiens*. You were then, as you are now, a distinct and complete — though, of course, immature — human organism.

Unlike the embryo, the sperm and egg whose union brings a human being into existence are not complete organisms. They are both functionally and genetically identifiable as *parts* of the male or female parents. Each has only half the genetic material needed to guide the development of a new human being toward maturity. They are destined either to combine to generate a new and distinct organism or simply die.

Even when fertilization occurs, the gametes do not survive: Their genetic material enters into the composition of a new organism. (A somatic cell that might be used to produce a human being by cloning is analogous not to a human embryo, but to gametes.) The difference between human gametes and a human being is a difference *in kind*, not a difference in stage of development. The difference between an embryonic human being (or a human fetus or infant) and an adult is merely a difference *in stage of development*.

Some today deny the moral premise of my position, namely, that human beings possess inherent dignity and a right to life simply by virtue of their humanity. They claim that some, but not all, human beings have dignity and rights. To have such rights, they say, human beings must possess some quality or set of qualities (sentience, self-consciousness, the immediately exercisable capacity for human mental functions, etc.) that other human beings do not possess or do not yet possess, or no longer possess.

I reject the idea that human beings at certain stages of development (embryos, fetuses, infants) or in certain conditions (the severely handicapped or mentally retarded, those suffering dementia) are not "persons" who possess dignity and a right to life. And no person may legitimately be destroyed in biomedical research or for other reasons.

Source: **www.npr.org/takingissue/takingissue_stemcells.html**

Name _____ Date _____ Period _____

Critical Reasoning Analysis Form

	For Embryonic Stem Cell Research	Against Embryonic Stem Cell Research
Point of View What is the point of view, and how does the particular perspective show through?		
Purpose Why was this material written?		
Questions What questions are addressed by the author? What questions do you have about the material?		
Information What are some of the most important facts included?		

Student Handout 5.4

Name _____ *Date* _____ *Period* _____

Critical Reasoning Analysis Form

	For Embryonic Stem Cell Research	Against Embryonic Stem Cell Research
Concepts What are the main ideas and concepts addressed?		
Implications What is the larger meaning? What are the consequences of the decision to be made?		
Assumptions What is the author assuming that might be subject to question?		
Inferences What can you infer and conclude based on the material?		

From the Foundation for Critical Thinking, **www.criticalthinking.org**, and Paula Fraser, Bellevue School District PRISM Program.

Name _____ Date _____ Period _____

Open-Ended Questions for a Socratic Seminar

When preparing for a Socratic Seminar, write questions using these sentence frames to stimulate your thinking about the article(s) you read. Choose and complete 5 of the following:

What puzzles me is…

I'd like to talk with people about…

I'm confused about…

Don't you think this is similar to…

Do you agree that the big ideas seem to be…

I have questions about…

Another point of view is…

I think it means…

Do you think…

What does it mean when the author says…

Do you agree that…

Name _____ Date _____ Period _____

Socratic Seminar Fishbowl Discussion Partner Evaluation

Name of person you are observing _____ Topic: _____

1) Record a check for each time your partner contributed in a meaningful way:

_____ _____ _____ _____ _____

2) On a scale of 1-5, with 5 being the highest, how well did your partner do at the following?

_____ **Analysis and Reasoning**

Did your partner….
Cite reasons and evidence for his/her statements with support from the text?
Demonstrate that they had given thoughtful consideration to the topic?
Provide relevant and insightful comments?
Demonstrate organized thinking?
Move the discussion to a deeper level?

Notes/Comments:

_____**Discussion Skills**

Did your partner…
Speak loudly and clearly?
Stay on topic?
Talk directly to other students rather than the teacher?
Stay focused on the discussion?
Invite other people into the discussion?
Share air time equally with others (didn't talk more than was fair to others)?

Notes/Comments:

_____ **Civility**

Did your partner…
Listen to others respectfully?
Enter the discussion in a polite manner?
Avoid inappropriate language (slang, swearing)?
Avoid hostile exchanges?
Question others in a civil manner?

Notes/Comments:

Socratic Seminar Rubric

	Exemplary	Proficient	Partially Proficient	Developing	Comments
Analysis and Reasoning	Clearly references text to support reasoning. Demonstrates thoughtful consideration of the topic. Provides relevant and insightful comments, makes new connections. Demonstrates exceptionally logical and organized thinking. Moves the discussion to a deeper level	Occasionally references text to support reasoning. Demonstrates consideration of the topic. Provides relevant comments. Thinking is clear and organized.	Rarely references text, may reference text incorrectly. Demonstrates awareness of the topic but little reflection on it. Comments are mostly relevant. Thinking is mostly clear and organized.	Does not reference text. Demonstrates little or no consideration of the topic. Comments are off-topic or irrelevant. Thinking is confused, disorganized, or stays at a very superficial level.	
Discussion Skills	Speaks loudly and clearly. Stays on topic and brings discussion back on topic if necessary. Talks directly to other students (rather than the teacher). Stays focused on the discussion. Invites other people into the discussion. Shares 'air time' equally with others. References the remarks of others.	Speaks at an appropriate level to be heard. Stays on topic and focused on the discussion. Aware of sharing 'air time' with others and may invite them into the conversation. May occasionally direct comments to teacher.	Mostly speaks at an appropriate level but may need to be coached. Sometimes strays from topic. Occasionally dominates the conversation.	Cannot be heard, or may dominate the conversation. Demonstrates inappropriate discussion skills.	

Socratic Seminar Rubric

	Exemplary	Proficient	Partially Proficient	Developing	Comments
Civility	Listens to others respectfully by making eye contact with the speaker, and waiting their turn to speak. Remarks are polite and demonstrate a high level of concern for the feelings of others. Addresses others in a civil manner, using a collegial and friendly tone.	Listens to others respectfully. Uses appropriate language and tone. Remarks demonstrate a concern for the feelings of others.	Listens to others respectfully, but may not always look at the speaker or may sometimes interrupt. Remarks demonstrate an awareness of feelings of others.	May be distracted or not focused on the conversation. Interrupts frequently. Remarks demonstrate little awareness or sensitivity to the feelings of others. Uses an aggressive, threatening, or otherwise inappropriate tone.	

Private vs. Public Funding for Stem Cell Research

Private Funding	Public Funding
No tax money used	Tax money used
May only benefit those who can pay	Possible benefit to a wider range of people
No governmental regulation specific to stem cells	Government regulation specific to stem cells is necessary
Able to use any stem cell lines and develop their own	Must abide by the National Institutes of Health Guidelines on Human Stem Cell Research.
Intellectual information can be patented and available only at a price	Any research findings are public domain and there are regulations about how they must be published
No oversight as to whether scientists are using ethical procedures	Government oversight and accountability is necessary

What do the 2009 National Institutes of Health (NIH) Guidelines on Human Stem Cell Research say?

The guidelines are based on the following principles:

1. Responsible research with human embryonic stem cells has the potential to improve our understanding of human health and illness and discover new ways to prevent and/or treat illness.
2. Individuals donating embryos for research purposes should do so freely, with voluntary and informed consent.

ELIGIBLE for Federal Funding

Research with human embryonic stem cells is eligible for federal funding if the embryos:

- are created using in vitro fertilization techniques for reproduction and are no longer needed for this purpose
- are donated voluntarily with adequate informed consent, including a statement that no payments of any kind are offered for the embryos.

NOT ELIGIBLE for Federal Funding

Research with human embryonic stem cells is NOT eligible for federal funding if the research involves:

- introducing human embryonic stem cells into non-human primate blastocysts.
- the breeding of animals where embryonic stem cells may contribute to the germ line.
- embryonic stem cells derived from other sources including therapeutic cloning (SCNT), embryos created solely for research purposes, or parthenogenesis.

The Dickey Amendment (an annual appropriations act) adds a twist in that federal funds may not be used for the actual destruction of the embryo, even though federal funds may be used to establish a stem cell line resulting from the destruction of the embryo.

With the exception of a few specific circumstances, the NIH Guidelines do not pertain to research using induced pluripotent stem (iPS) cells since their formation does not involve the destruction of a human embryo.

Source:

Stem Cell Information [World Wide Web]. Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services, 2009. **http://stemcells.nih.gov/policy/2009guidelines**

Lesson 5

Opposing Views: President Bush Speaks

President Bush Discusses Stem Cell Research

August 9, 2001 8:01 P.M. CDT

1 THE PRESIDENT: Good evening. I appreciate you giving me a few minutes of your time tonight so I can discuss with you a complex and difficult issue, an issue that is one of the most profound of our time.

2 The issue of research involving stem cells derived from human embryos is increasingly the subject of a national debate and dinner table discussions. The issue is confronted every day in laboratories as scientists ponder the ethical ramifications of their work. It is agonized over by parents and many couples as they try to have children, or to save children already born.

3 The issue is debated within the church, with people of different faiths, even many of the same faith coming to different conclusions. Many people are finding that the more they know about stem cell research, the less certain they are about the right ethical and moral conclusions.

4 My administration must decide whether to allow federal funds, your tax dollars, to be used for scientific research on stem cells derived from human embryos. A large number of these embryos already exist. They are the product of a process called *in vitro* fertilization, which helps so many couples conceive children. When doctors match sperm and egg to create life outside the womb, they usually produce more embryos than are planted in the mother. Once a couple successfully has children, or if they are unsuccessful, the additional embryos remain frozen in laboratories.

5 Some will not survive during long storage; others are destroyed. A number have been donated to science and used to create privately funded stem cell lines. And a few have been implanted in an adoptive mother and born, and are today healthy children.

6 Based on preliminary work that has been privately funded, scientists believe further research using stem cells offers great promise that could help improve the lives of those who suffer from many terrible diseases — from juvenile diabetes to Alzheimer's, from Parkinson's to spinal cord injuries. And while scientists admit they are not yet certain, they believe stem cells derived from embryos have unique potential.

7 You should also know that stem cells can be derived from sources other than embryos — from adult cells, from umbilical cords that are discarded after babies are born, from human placenta. And many scientists feel research on these type of stem cells is also promising. Many patients suffering from a range of diseases are already being helped with treatments developed from adult stem cells.

8 However, most scientists, at least today, believe that research on embryonic stem cells offer the most promise because these cells have the potential to develop in all of the tissues in the body.

9 Scientists further believe that rapid progress in this research will come only with federal funds. Federal dollars help attract the best and brightest scientists. They ensure new discoveries are widely shared at the largest number of research facilities and that the research is directed toward the greatest public good.

10 The United States has a long and proud record of leading the world toward advances in science and medicine that improve human life. And the United States has a long and proud record of upholding the highest standards of ethics as we expand the limits of science and knowledge. Research on embryonic stem cells raises profound ethical questions, because extracting the stem cell destroys the embryo, and thus destroys its potential for life. Like a snowflake, each of these embryos is unique, with the unique genetic potential of an individual human being.

11 As I thought through this issue, I kept returning to two fundamental questions: First, are these frozen embryos human life, and therefore, something precious to be protected? And second, if they're going to be destroyed anyway, shouldn't they be used for a greater good, for research that has the potential to save and improve other lives?

12 I've asked those questions and others of scientists, scholars, bioethicists, religious leaders, doctors, researchers, members of Congress, my Cabinet, and my friends. I have read heartfelt letters from many Americans. I have given this issue a great deal of thought, prayer and considerable reflection. And I have found widespread disagreement.

13 On the first issue, are these embryos human life — well, one researcher told me he believes this five-day-old cluster of cells is not an embryo, not yet an individual, but a pre-embryo. He argued that it has the potential for life, but it is not a life because it cannot develop on its own.

14 An ethicist dismissed that as a callous attempt at rationalization. Make no mistake, he told me, that cluster of cells is the same way you and I, and all the rest of us, started our lives. One goes with a heavy heart if we use these, he said, because we are dealing with the seeds of the next generation.

And to the other crucial question, if these are going to be destroyed anyway, why not use them for good purpose — I also found different answers. Many argue these embryos are byproducts of a process that helps create life, and we should allow
15 couples to donate them to science so they can be used for good purpose instead of wasting their potential. Others will argue there's no such thing as excess life, and the fact that a living being is going to die does not justify experimenting on it or exploiting it as a natural resource.

At its core, this issue forces us to confront fundamental questions about the beginnings of life
16 and the ends of science. It lies at a difficult moral intersection, juxtaposing the need to protect life in all its phases with the prospect of saving and improving life in all its stages.

As the discoveries of modern science create tremendous hope, they also lay vast ethical mine fields. As the genius of science extends the horizons of what we can do, we increasingly
17 confront complex questions about what we should do. We have arrived at that brave new world that seemed so distant in 1932, when Aldous Huxley wrote about human beings created in test tubes in what he called a "hatchery."

In recent weeks, we learned that scientists have created human embryos in test tubes solely to
18 experiment on them. This is deeply troubling, and a warning sign that should prompt all of us to think through these issues very carefully.

Embryonic stem cell research is at the leading edge of a series of moral hazards. The initial stem cell researcher was at first reluctant to begin his research, fearing it might be used for
19 human cloning. Scientists have already cloned a sheep. Researchers are telling us the next step could be to clone human beings to create individual designer stem cells, essentially to grow another you, to be available in case you need another heart or lung or liver.

I strongly oppose human cloning, as do most Americans. We recoil at the idea of growing human beings for spare body parts, or creating life for our convenience. And while we must
20 devote enormous energy to conquering disease, it is equally important that we pay attention to the moral concerns raised by the new frontier of human embryo stem cell research. Even the most noble ends do not justify any means.

My position on these issues is shaped by deeply held beliefs. I'm a strong supporter of science and technology, and believe they have the potential for incredible good — to improve lives, to save life, to conquer disease. Research offers hope that millions
21 of our loved ones may be cured of a disease and rid of their suffering. I have friends whose children suffer from juvenile diabetes. Nancy Reagan has written me about President Reagan's struggle with Alzheimer's. My own family has confronted the tragedy of childhood leukemia. And, like all Americans, I have great hope for cures.

I also believe human life is a sacred gift from our Creator. I worry about a culture that devalues life, and believe as your President I have an important obligation to foster and encourage respect for
22 life in America and throughout the world. And while we're all hopeful about the potential of this research, no one can be certain that the science will live up to the hope it has generated.

Eight years ago, scientists believed fetal tissue research offered great hope for cures and treatments — yet, the progress to date has not lived
23 up to its initial expectations. Embryonic stem cell research offers both great promise and great peril. So I have decided we must proceed with great care.

As a result of private research, more than 60 genetically diverse stem cell lines already exist. They were created from embryos that have already been destroyed, and they have the ability to
24 regenerate themselves indefinitely, creating ongoing opportunities for research. I have concluded that we should allow federal funds to be used for research on these existing stem cell lines, where the life and death decision has already been made.

Leading scientists tell me research on these 60 lines has great promise that could lead to breakthrough therapies and cures. This allows us to explore the
25 promise and potential of stem cell research without crossing a fundamental moral line, by providing taxpayer funding that would sanction or encourage further destruction of human embryos that have at least the potential for life.

I also believe that great scientific progress can be made through aggressive federal funding of research on umbilical cord placenta, adult and
26 animal stem cells which do not involve the same moral dilemma. This year, your government will spend $250 million on this important research.

I will also name a President's council to monitor stem cell research, to recommend appropriate guidelines and regulations, and to consider all of the medical and ethical ramifications of
27 biomedical innovation. This council will consist of leading scientists, doctors, ethicists, lawyers, theologians and others, and will be chaired by Dr. Leon Kass, a leading biomedical ethicist from the University of Chicago.

This council will keep us apprised of new developments and give our nation a forum to continue to discuss and evaluate these important issues. As we go forward, I hope we will always be guided by both intellect and heart, by both our capabilities and our conscience.

28 I have made this decision with great care, and I pray it is the right one.

Thank you for listening. Good night, and God bless America.

END 8:12 P.M. CDT

Lesson 5

Opposing Views: Nobel Laureates Speak

Nobel Laureates' Letter to President Bush

Eighty Nobel laureates were among those who signed a letter to President Bush urging funding for research on human embryo cells.

**To the Honorable George W. Bush,
President of the United States**

1 We the undersigned urge you to support Federal funding for research using human pluripotent stem cells. We join with other research institutions and patient groups in our belief that the current National Institutes of Health (NIH) guidelines, which enable scientists to conduct stem cell research within the rigorous constraints of federal oversight and standards, should be permitted to remain in effect. The discovery of human pluripotent stem cells is a significant milestone in medical research. Federal support for the enormous creativity of the US biomedical community is essential to translate this discovery into novel therapies for a range of serious and currently intractable diseases.

2 The therapeutic potential of pluripotent stem-cells is remarkably broad. The cells have the unique potential to differentiate into any human cell type. Insulin-producing cells could be used to treat — or perhaps even cure — patients with diabetes, cardiomyocytes could be used to replace damaged heart tissue, chondrocytes could be used for arthritis, and neurons for Parkinson's, Alzheimer's, ALS and spinal cord injuries to name a few examples. There is also the possibility that these cells could be used to create more complex, vital organs, such as kidneys, livers, or even entire hearts.

3 Some have suggested that adult stem cells may be sufficient to pursue all treatments for human disease. It is premature to conclude that adult stem cells have the same potential as embryonic stem cells — and that potential will almost certainly vary from disease to disease. Current evidence suggests that adult stem cells have markedly restricted differentiation potential. Therefore, for disorders that prove not to be treatable with adult stem cells, impeding human pluripotent stem cell research risks unnecessary delay for millions of patients who may die or endure needless suffering while the effectiveness of adult stem cells is evaluated.

4 The therapeutic promise of pluripotent stem cells is based on more than two decades of research in mice and other animal models. This research confirms that pluripotent stem cells are capable of generating all of the cell types of the body. Most importantly, the therapeutic potential of these cells has already been demonstrated. Cardiomyocytes generated in the laboratory from these cells have been transplanted into the hearts of dystrophic mice where they formed stable intracardiac grafts. Nerve cells have successfully reversed the progression of the equivalent of multiple sclerosis in mice and have restored function to the limbs of partially paralyzed rats; and insulin-secreting cells have normalized blood glucose in diabetic mice. These findings suggest that therapies using these cells may one day provide important new strategies for the treatment for a host of currently untreatable disorders.

5 While we recognize the legitimate ethical issues raised by this research, it is important to understand that the cells being used in this research were destined to be discarded in any case. Under these circumstances, it would be tragic to waste this opportunity to pursue the work that could potentially alleviate human suffering. For the past 35 years many of the common human virus vaccines — such as measles, rubella, hepatitis A, rabies and poliovirus — have been produced in cells derived from a human fetus to the benefit of tens of millions of Americans. Thus precedent has been established for the use of fetal tissue that would otherwise be discarded.

6 We urge you to allow research on pluripotent stem cells to continue with Federal support, so that the tremendous scientific and medical benefits of their use may one day become available to the millions of American patients who so desperately need them.

Yours respectfully,

Kenneth J. Arrow*, Stanford University

Julius Axelrod*, National Institute of Mental Health, Education & Welfare

Baruj Benacerraf*, Dana-Farber Cancer Institute

Paul Berg*, Stanford University

J. Michael Bishop*, University of California, San Francisco

Nicolaas Bloembergen*, Harvard University

Herbert C. Brown*, Purdue University

Jose Cibelli, Advanced Cell Technology

Stanley Cohen*, Vanderbilt University School of Medicine

Leon N. Cooper*, Brown University

E. J. Corey*, Harvard University

James W. Cronin*, University of Chicago

Robert Curl, Jr.*, Rice University

Peter Doherty*, St. Jude Children's Research Hospital

Johann Deisenhofer*, University of Texas Southwestern Medical Center

Reneto Dulbecco*, Salk Institute

Edmond H. Fischer*, University of Washington

Val L. Fitch*, Princeton University

Robert Fogel*, University of Chicago

Jerome I. Friedman*, Massachusetts Institute of Technology

Milton Friedman*, Hoover Institute

Robert F. Furchgott*, State University of New York Health Sciences Center

Murray Gell-Mann*, Santa Fe, NM

Walter Gilbert*, Harvard University

Alfred Gilman*, University of Texas, Southwestern Medical Center

Donald Glaser*, University of California, Berkeley

Sheldon Lee Glashow*, Boston University

Ronald M. Green, Dartmouth College

Paul Greengard*, The Rockefeller University

Roger Guillemin*, The Salk Institute

Leonard Hayflick, University of California, San Francisco

Herbert A. Hauptman*, Hauptman-Woodward Medical Research

James J. Heckman*, University of Chicago

Alan Heeger*, University of California, Santa Barbara

Dudley Herschbach*, Harvard Medical School

David H. Hubel*, Harvard Medical School

Russell Hulse*, Plasma Physics Laboratory

Eric Kandel*, Columbia University

Jerome Karle*, Washington, D.C.

Lawrence R. Klein*, University of Pennsylvania

Walter Kohn*, University of California, Santa Barbara

Arthur Kornberg*, Stanford University School of Medicine

Edwin G. Krebs*, University of Washington

Robert P. Lanza+, Advanced Cell Technology

Robert Laughlin*, Stanford University

Leon Lederman*, Illinois Institute of Technology

David M. Lee*, Cornell University

Edward Lewis*, California Institute of Technology

William Lipscomb, Jr.*, Harvard University

Rudolph A. Marcus*, California Institute of Technology

Daniel McFadden*, University of California, Berkeley

R. Bruce Merrifield*, The Rockefeller University

Robert Merton*, Harvard University Graduate School of Business Administration

Franco Modigliani*, Massachusetts Institute of Technology

Mario J. Molina*, Massachusetts Institute of Technology

Ferid Murad*, University of Texas Medical School

Marshall W. Nirenberg*, NIH National Heart, Lung & Blood Institute

Douglass C. North*, Washington University

George A. Olah*, University of Southern California

Douglas Osheroff*, Stanford University

George E. Palade*, University of California, San Diego

Martin Perl*, Stanford University

Norman F. Ramsey*, Harvard University

Burton Richter*, Stanford University

Richard J. Roberts*, New England Biolabs

Paul A. Samuelson*, Massachusetts Institute of Technology

Melvin Schwartz*, Columbia University

Phillip A. Sharp*, Massachusetts Institute of Technology

Richard E. Smalley*, Rice University

Hamilton O. Smith*, Celera Genomics

Robert M. Solow*, Massachusetts Institute of Technology

Horst Stormer*, Columbia University

Henry Taube*, Stanford University

Richard Taylor*, Stanford University

E. Donnall Thomas*, University of Washington

James Tobin*, Yale University

Susumu Tonegawa*, Massachusetts Institute of Technology

Charles Townes*, University of California, Berkeley

James D. Watson*, Cold Spring Harbor Laboratory

Steven Weinberg*, University of Texas

Thomas H. Weller*, Harvard School of Public Health

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Eric F. Wieschaus*, Princeton University

Torsten N. Wiesel*, The Rockefeller University

Robert W. Wilson*, Harvard-Smithsonian Center for Astrophysics

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