



VEA

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## ***Program Support Notes***

Senior Secondary - Tertiary

30mins

# **Stem Cells The Ethical Issues**

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Produced by ***Rod Rees and Associates***

Distributed by ***VEA Pty Ltd***

Suitable for:

**Life Science**

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## For Teachers:

### Introduction

#### Main Program

A range of viewpoints on key ethical issues raised by:

- embryonic stem cell research
- therapeutic cloning (nuclear transfer)
- reproductive cloning

#### Extras:

- Ethics and genetic testing of IVF embryos (7 min)
- Ethics and IVF (2 min)

### Using the Program

The main program is presented in clear-cut sections. It can be stopped at any point, for discussion and questions. Alternatively, the entire program can be viewed without break, with questions at the end. The worksheet questions are presented in the same order as the topics are dealt with in the program. They vary in complexity from straight-forward points of fact to questions where the response requires application and synthesis.

### Program Timeline

00:00:30	Opening Section
00:04:30	'What is an Embryo?'
00:06:00	'Whose Rights Should Come First?'
00:07:00	Nuclear Transfer (or Therapeutic Cloning)
00:13:20	Reproductive Cloning
00:16:40	'What Medical Benefits Will Research Lead to?'
00:20:00	Main program end
00:20:30	Ethics and Genetic Testing of IVF Embryos
00:27:00	Ethics and IVF

### Other Relevant Programs Available from VEA

- Understanding Stem Cells
- Genes, Stem Cell and Society
- Genes and Inheritance
- Cellular Signalling
- Genes and Cloning

*Please visit our website for many more relevant programs [www.veavideo.com](http://www.veavideo.com)*

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## Stem Cells - The Ethical Issues

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### Student Worksheet:

#### *Before Viewing the Program*

1. The program and worksheets could be used to introduce some of the topics covered in the program.
2. A second option would be, before showing the program, to present some basic background about:
  - Concepts of embryo and foetus
  - The role of stem cells in the body
  - Injuries that cannot currently be repaired (e.g. break in spinal cord)
  - Examples of degenerative disease (e.g. Motor Neurone Disease, Alzheimer's Disease)
3. Another activity would be to discuss one or more recent newspaper articles about the stem cell debate. These may raise questions such as:
  - Why are researchers so keen to study embryonic stem cells?
  - Why do some people object to this research?
  - When does human life begin?
  - Should embryos have the same rights as humans who have been born?
  - Who should decide what is done with 'excess' IVF embryos: the parents, scientists, or Government?
4. A third activity would be for students to find out what they can about a genetic disease such as Friedreich's Ataxia (a rare disorder that typically appears in the teenage years):
  - What are the symptoms?
  - What treatment is currently possible?
  - Is there a patient support group in your city or region?

NB: before seeing the program, it would be an advantage to view the companion program: '*Understanding Stem Cells*'.

# Stem Cells - The Ethical Issues

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## While Viewing the Program

### Main Program

#### Opening Section

1. Two people express their opinion about research using human embryos. What are their viewpoints, and what reason does each give for their view?

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2. Why are scientists and doctors interested in stem cells?

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3. Can stem cells be collected from an embryo without destroying it?

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4. What sort of human embryos are researchers able to 'harvest' stem cells from?

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5. What does Professor Alan Trounson argue is a strong reason to do research using embryonic stem cells?

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6. What does Father Norman Ford see as the motive of scientists doing this research?

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7. Norman Ford is opposed to such research. What is his view about the rights of an embryo, and what is this view based on?

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## Stem Cells - The Ethical Issues

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8. The only IVF embryos used for stem cell research are those that:
- a) will otherwise be discarded
  - b) the parents have given permission for use in research

What are the arguments for and against using such embryos for research?

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### What is an Embryo

9. How does an early embryo differ from a foetus?

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10. Two different views are expressed about an early embryo. Summarise these different views.

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### Whose Rights Should Come First

11. Different views are expressed about the rights of an early embryo vs. people with life-threatening diseases. Summarise these different views.

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## Stem Cells - The Ethical Issues

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### Nuclear Transfer (or Therapeutic Cloning)

12. Nuclear transfer is a new way to produce embryonic stem cells. How is this technique used to make a 'cloned' embryo?

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13. Why do scientists want to use nuclear transfer to produce embryonic stem cells?

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14. A patient with Motor Neurone Disease describes the effects on him of this life-threatening condition. What are these effects?

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15. Father Norman Ford raises two objections to creating cloned embryos for medical research. What are his objections?

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16. A research scientist presents an alternative view about the creation of a cloned embryo. What is that view?

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17. Therapeutic cloning requires human eggs to be donated. What is the ethical question raised here by the researcher?

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## Stem Cells - The Ethical Issues

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18. One alternative to using human eggs could be to use eggs from animals such as rabbits. What are the two views expressed about this?

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### Reproductive Cloning

19. Producing a cloned human embryo could in theory open up the possibility of reproductive cloning. What is reproductive cloning?

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20. What is the difference between reproductive cloning and therapeutic cloning?

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21. Are stem cell scientists in favour of human reproductive cloning?

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22. What are some of the ethical objections to human reproductive cloning outlined by the commentators?

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23. If a child did result from a cloning process, which parent would be its biological parent – both, just one, or neither?

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24. Does human cloning ever occur naturally?

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## Stem Cells - The Ethical Issues

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### *'What Medical Benefits Will Research Lead to?'*

25. Is it possible to know in advance what medical benefits will result from embryonic stem cell research?

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26. The likelihood or otherwise of major benefits from such research often comes up in the stem cell debate. Is this really an ethical issue? Why do you think it is part of the debate?

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27. A final ethical issue faced by researchers is mentioned concerning patients. What is the issue?

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# Stem Cells - The Ethical Issues

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## Extras:

### Genetic Testing of IVF Embryos

As well as helping infertile couples, IVF has also made it possible to do genetic tests on an early embryo - before a pregnancy even begins. This technique is called PGD, which stands for 'Pre-implantation Genetic Diagnosis'.

This section looks at several case studies and some of the issues raised.

#### Case Study 1: Cystic Fibrosis

1. A couple has a child with cystic fibrosis, a serious genetic disease. Before PGD was possible, what options did the couple have if they wanted to have more children?

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2. What new option does PGD given such couples?

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3. What are the arguments presented for and against this procedure?

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#### Case Study 2: The Donor Sibling

A child has a life-threatening blood disease. The parents use IVF to select an embryo that will hopefully be a 'donor sibling' – providing life-saving stem cells for the sick child.

4. What are the arguments presented for and against this procedure?

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### Case Study 3: Sex Selection

5. It is possible to use PGD to tell whether an embryo is male or female. What is the view presented by the research scientist about doing this?

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6. Do the laws of your country or state allow PGD to be used for this purpose? Does it depend on the circumstances of the couple (e.g. a particular inherited disease in the family)?

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7. What is the term commonly used to describe the use of PGD to select features for 'non-medical' reasons?

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### Ethics and IVF

Embryonic stem cell research is closely linked to IVF. This section looks at some of the issues raised by IVF itself.

8. Father Norman Ford raises two different objections to the IVF process. What are they? What are these objection based on?

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9. Is it possible for infertile couples to use IVF without 'leftover' embryos being produced? What does the research scientist say about this?

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## Stem Cells - The Ethical Issues

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### After Viewing the Program

#### Main Program

1. A recent newspaper editorial described therapeutic cloning as a subject that 'pits morality against science'. What assumptions are built into that idea? Is it a fair statement?
2. Summarise your own views about whether the following procedures should be permitted, and state your reasons:
  - Embryonic stem cell research
  - Therapeutic cloning
  - Reproductive cloning

#### Extras

1. Summarise your own views about whether the following procedures should be permitted, and state your reasons:
  - IVF
  - Genetic testing of IVF embryos

## Stem Cells - The Ethical Issues

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### **Useful Resources**

- Elizabeth Finkel: *Stem Cells: Controversy at the frontiers of science* (ABC books)
- Norman M Ford and Michael Herbert: *Stem Cells: Science, medicine, law and ethics* (St Pauls publishing)

### **Website References**

- National Institutes of Health – Research Ethics and Stem Cells  
<http://stemcells.nih.gov/info/ethics.asp>
- Friedreich's Ataxia Research Alliance  
<http://www.faresearchalliance.org>