

# LESSON PLAN

## Stem Cell Discussion

### Learning objectives

Students will:

- consider the implications of stem cell research
- research the current research situation
- debate the future of stem cell technologies.

### Suggested lesson plan

Activity	Details
<b>Introduction</b>	<ul style="list-style-type: none"> <li>• Watch the video at <a href="http://www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Human-Fertilisation-and-Embryology-Act/Interviews/WT040053.htm">www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Human-Fertilisation-and-Embryology-Act/Interviews/WT040053.htm</a> where Mark Walport, Director of the Wellcome Trust, discusses why stem cells have the potential to treat many debilitating diseases, and why it is important to keep all avenues of research open.</li> <li>• Pages 12–13 of <i>Big Picture: The Cell</i> explore some of the ethical, moral and social implications of stem cell research. Photocopy these pages and distribute to students to read.</li> <li>• Make a list of advantages and disadvantages of using embryonic stem cells in research.</li> <li>• Ask students to vote on whether they think researchers should be allowed to use embryonic stem cells.</li> </ul>
<b>Discussion</b>	<ul style="list-style-type: none"> <li>• Choose one of the following to discuss: admixed embryos, umbilical stem cells or Pluri-U (you may have time to do more than one or even all three).</li> </ul>
<b>a) Admixed embryos</b>	<ul style="list-style-type: none"> <li>• In 2008 the second UK Human Fertilisation and Embryology Act was passed, amending the 1990 Act, allowing researchers, under tight controls, to create animal–human hybrid embryos by replacing the nucleus from an animal egg with a nucleus from a human body cell.</li> <li>• Watch the animation at <a href="http://www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Human-Fertilisation-and-Embryology-Act/Humanadmixedembryos/index.htm">www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Human-Fertilisation-and-Embryology-Act/Humanadmixedembryos/index.htm</a>, which shows how admixed embryos are created.</li> <li>• Read the <i>Big Picture</i> text on page 13 on admixed embryos and consider the question ‘Is creating a human admixed embryo from a mature human cell for research more acceptable ethically than using a human embryonic stem cell?’</li> <li>• Put ‘never acceptable’ at one end of the classroom and ‘completely acceptable’ at the other and ask students to line up in terms of using embryonic stem cells and then using admixed embryos. Discuss their reasons for their decisions and any difference in opinion between the results of the two.</li> </ul>
<b>b) Umbilical stem cells</b>	<ul style="list-style-type: none"> <li>• Read the information about umbilical stem cells on page 12 of <i>Big Picture</i>.</li> <li>• Line up as before but this time asking about the use of umbilical stem cells. How does this compare with embryonic stem cells or admixed embryos?</li> <li>• Consider the question posed in <i>Big Picture</i>: ‘Should it become obligatory for women who give birth to donate their umbilical cord blood for research?’</li> </ul>

c) Pluri-U	<ul style="list-style-type: none"> <li>• Read the text and advert named Pluri-U on page 13 of <i>Big Picture</i>. What do you think about this scenario?</li> <li>• Consider the question posed in the magazine: ‘What about using stem cells to enhance humans – do you think it would be acceptable to use the same technology to make you stronger or able to run faster?’</li> <li>• Working in groups, imagine another product based on stem cell technologies that could be produced in the future. Design an advert like the Pluri-U advert in <i>Big Picture</i> for your product.</li> </ul>
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### Additional information

- Background information, animations and quizzes about stem cells from the University of Utah: [learn.genetics.utah.edu/content/tech/stemcells/](http://learn.genetics.utah.edu/content/tech/stemcells/)
- Ethics of stem cells: [www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Human-Fertilisation-and-Embryology-Act/Stem-cell-basics/WTD040077.htm](http://www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Human-Fertilisation-and-Embryology-Act/Stem-cell-basics/WTD040077.htm)
- History of the HFE Act: [www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Human-Fertilisation-and-Embryology-Act/History/index.htm](http://www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Human-Fertilisation-and-Embryology-Act/History/index.htm)
- Tips and resources for debating and discussing controversial issues: [www.at-bristol.org.uk/cz/teachers/Default.htm](http://www.at-bristol.org.uk/cz/teachers/Default.htm)
- BEEP (Bioethics Education Project) activities and resources: [www.beep.ac.uk/content/index.php](http://www.beep.ac.uk/content/index.php)