

True or False statements about Stem Cells

Introduction

This short activity allows students to check that they understand some of the science behind stem cells and cloning and can distinguish what is possible now from what is hoped for in the future.

The activity

Students can discuss the statements in small groups before a whole class discussion on the answers. We will do our best to keep this up to date.

- Stem cells would allow you to grow a new heart.
FALSE *It might be possible to grow heart cells but not the whole structure of a heart*
- Doctors are treating Alzheimer's patients with stem cells on an experimental basis.
FALSE *There is much talk about potential treatments for Alzheimer's, using stem cells, but it is a very long way off*
- Doctors are routinely using stem cell therapy for some diseases.
TRUE *Bone marrow transplants are an example of stem cell therapy*
- Stem cells are only found in embryos.
FALSE *Embryos are the only source of stem cells that can develop into any type of cell in the body. Tissues such as skin or bone marrow contain stem cells that can develop into a limited range of cell types*
- A muscle stem cell could divide to produce muscle cells.
TRUE *Muscle stem cells are there to repair muscles with new muscle cells. They cannot become other types of cell*
- Embryonic stem cells are usually obtained from surplus IVF embryos
TRUE *IVF often produces more embryos than are required for implantation. With the parents' consent these surplus embryos can be used for research*
- Stem cells can be made to divide continuously in culture.
TRUE *In the right conditions they will go on dividing without specialising*
- Doctors can create human embryos by putting the nucleus of a cell from one person into a human egg with the nucleus removed. The egg is then treated to start development
TRUE/ FALSE *At the time of writing (April 2008) one research team has claimed this but their claims were later found to be fraudulent. Another team has recently claimed success but this work is not yet published or replicated. It is possible to create animal embryos in this way.*

How Science Works

Bb In addition to the basic functions carried out by all cells, most cells in larger organisms are specialised and carry out particular functions. The processes by which this specialisation occurs in the early development of an organism are very complex and are still not fully understood.

Once they have become specialised, cells of animals stay specialised so that it is not easy to produce clones

Bc Stem cells are cells that have not specialised. Embryonic stem cells can give rise to any type of specialised cell under the right conditions. Adult stem cells have developed partial specialisation and can only give rise to a limited number of new types of cell.

Cg Cloning is a way of making a genetically identical copy of an organism.

9. Hybrid embryos, using animal eggs for the procedure described in statement 8, are needed for research because of the shortage of human eggs
TRUE *Extracting human eggs is an unpleasant procedure and few willing donors are available.*
10. Doctors are trying to produce hybrid embryos as a source of stem cells for research by mixing human sperm and an animal egg
FALSE *They are created by the procedure in statement 8/9 and contain almost entirely human DNA. Some of the opposition to hybrid embryos for research is because of a failure to understand the procedure actually used.*
11. A cloned human being can be made if an embryo, created as described in statement 8, is implanted into a woman's uterus.
FALSE *It is theoretically possible but in practice the process is so inefficient that it is unlikely to work. It is also illegal in most countries. Animals, such as Dolly the sheep, have been created by this process.*

April, 2008

True or False statements about Stem Cells

Read each of the following statements, decide if they are true or false and give a reason for your decision.

1. Stem cells would allow you to grow a new heart.
2. Doctors are treating Alzheimer's patients with stem cells, on an experimental basis.
3. Doctors are routinely using stem cell therapy for some diseases.
4. Stem cells are only found in embryos.
5. A muscle stem cell could divide to produce muscle cell.
6. Embryonic stem cells are usually obtained from surplus IVF embryos.
7. Stem cells can be made to divide continuously in culture.
8. Doctors can create human embryos by putting the nucleus of a cell from one person into a human egg with the nucleus removed. The egg is then treated to start development.
9. Hybrid embryos, using animal eggs for the procedure described in statement 8, are needed for research because of the shortage of human eggs.
10. Doctors are trying to produce hybrid embryos as a source of stem cells for research by mixing human sperm and an animal egg.
11. A cloned human being can be made if an embryo, created as described in statement 8, is implanted into a woman's uterus.