

CLONES AND STEM CELLS

Dr. Chris Skidmore

22 August 2007

Part 1

1. In his introduction, what key areas does the lecturer say he will cover in his lecture?
2. When was the word 'clone' originally used?
3. What is the key characteristic of a clone?
4. What does the lecturer say was done in 1980's and 1990's?

Part 2

5. How does the lecturer define clones?
6. How are multi-cellular organisms different from clones?
7. What is 'differentiation' in DNA terms?
8. What are stem cells'?
9. Where are stem cells found?

Part 3

10. What is a blastocyst?
11. What does he say the inner mass of 30 cells will become?
12. How does he describe the meaning of totipotent?

Part 4

13. He mentions that plants are more 'plastic' than animal organisms. What does he mean by this?
14. What was the purpose of the experiment conducted by Steward concerning the carrot and the coconut milk?
15. What is the disadvantage of producing cloned plants or trees?

Part 5

16. Why are cloning experiments conducted with toads?
17. What made it possible to start experimenting seriously with mammals?
18. What experiment was Ian Wilmut working on?

Part 6

19. What is reproductive cloning?

Part 7

20. What is the difference between reproductive cloning and therapeutic cloning?
21. What is the lecturer's view about human cloning?
22. What is the lecturer's view on therapeutic cloning?

Key

1.
 - a) explanation on what he means by a clone
 - b) the process of the growth of multi-cell organisms
 - c) a short history of cloning
 - d) the possibilities of using stem cells in replacement therapy
2. It was used to describe how plants were cultivated, from one stock, through a method called grafting.
3. It is reproduced asexually, and it is genetically identical to the original gene.
4. DNA was cloned in plates using bacteria, and all cells had the same DNA.
5. A group of cells or organisms which have the same genetic identity
6. The lecturer describes how multi-cellular animals grow phenotypes – cells with different characteristics.
7. It is a process whereby stem cells can divide to produce many different kinds of cells, e.g. for bone marrow.
8. Unspecialised cells, which can keep dividing. They can develop into different kinds of cells.

9. In bone marrow, in the embryo, in the blood; they can be found in many places and can replace and repair where necessary.
10. It is an early form of embryo.
11. It will become a foetus and then an adult; in this case a mouse.
12. He says it can be used to describe the ability of cells to develop many different kinds of cells, not only produce one type of cell.
13. That they are more flexible and changeable; they can be changed more easily than animal organisms.
14. He wanted to create a situation whereby the carrot cells would 'regress' and go back to the stage before they were cells, when they were like an embryo.
15. If a disease attacks one specimen, it can transfer easily to attack all others because they are the same.
16. Because toads have large eggs and the eggs float on water, which makes it easy to deal with.
17. The amount of money that was available; there was interest in changing the genes of farm animals.
18. He was using unfertilised eggs, taking out the nucleus, adding in a different nucleus, and then zapping it with electricity, and then putting it into a surrogate mother.
19. A new animal is made
20. Reproductive cloning makes a new animal. Therapeutic cloning can improve health.
In reproductive cloning a whole animal is produced, with a surrogate mother. In therapeutic cloning the egg and cell are fused in a petrie dish, to produce differentiated cells, which can then be used to cure the human body.
21. Cloning has had a very low success rate, which is only about 3%. There is too little is known about it, and the person born could be disabled.
22. He thinks that morally it is not a good thing, as each embryo is potentially a new life, whereas with stem cells you are taking your own cells and reproducing from them.