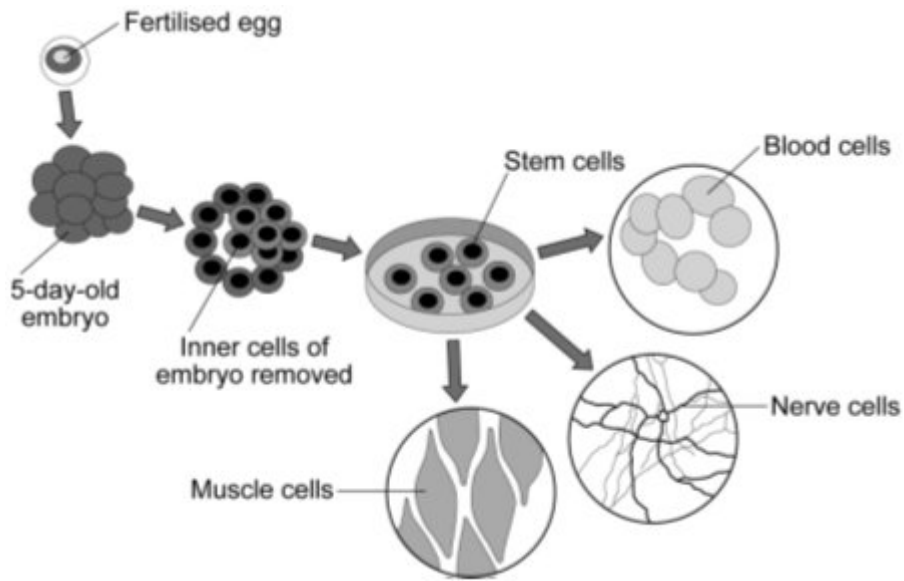


Questions about the uses of stem cells

Q1. The diagram shows one way that stem cells can be produced from human embryos.



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(a) Stem cells can be used to treat a condition such as paralysis.

Explain why.

.....

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.....

.....

(2)

(b) During pregnancy, an umbilical cord and a placenta join the embryo to the mother. At birth the umbilical cord is cut.

Stem cells can be obtained from the umbilical cord.

Many people think that the stem cells for treating human conditions should be obtained from umbilical cords rather than human embryos.

Suggest **one** reason why.

.....

.....

(1)

(c) Stem cells from a recently dead embryo can be grown in special solutions.

Some facts about stem cells are given below.

- Stem cells from an embryo can grow into any type of tissue.
- Stem cells may grow out of control, to form cancers.
- Large numbers of stem cells can be grown in the laboratory.
- Stem cells may be used in medical research or to treat some human diseases.
- Patients treated with stem cells need to take drugs for the rest of their life to prevent rejection.
- Collecting and growing stem cells is expensive.

Use **only** the information above to answer these questions.

(i) Give **two** advantages of using stem cells.

1

.....

2

.....

(2)

(ii) Give **two** disadvantages of using stem cells.

1

.....

2

.....

(2)

(Total 6 marks)

- M1.** (a) because stem cells can (be made) to differentiate 1
 into nerve / muscle cells 1
- (b) ethical issues with destruction / damage to embryo 1
- (c) mitosis one cell division, meiosis two cell division 1
- cells produced by mitosis have two sets of chromosomes,
 cells produced by meiosis have one set of chromosomes
*accept cells produced by mitosis are genetically identical,
 cells produced by meiosis have some genetic differences* 1

[5]

- M2.** (a) chromosomes 1
- (b) diagram showing four separate chromosomes two long and two short
 (as in diagram 1)
*allow each chromosome shown as two joined chromatids
 do **not** allow if chromosomes touching each other* 1
- (c) (i) any **two** from:
 • can grow into any type of tissue / named tissue
 • used in medical research
 • used to treat human diseases
 • large numbers can be grown 2

(ii) any **two** from:

- expensive
- grow out of control / ref cancers
- may be rejected
- need for drugs (for rest of life)

2

[6]