

3. Stem cells are used in research to study how diseases develop.

(a) (i) State one other research use of stem cells.

1

(ii) Describe a property of embryonic stem cells, which makes them useful for research.

1

(iii) Suggest an ethical reason why medical research may involve the use of embryonic stem cells.

1

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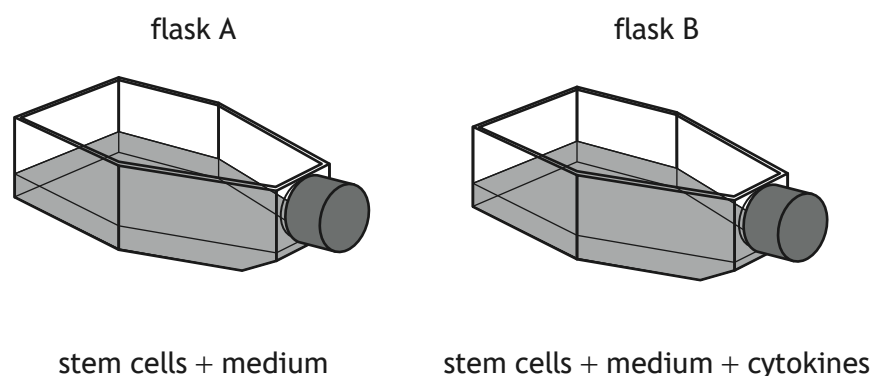


3. (continued)

- (b) When culturing stem cells, substances called cytokines can be included in the culture medium.

An investigation was carried out to determine the effect of cytokines on the growth of stem cells.

Cultures of stem cells were set up as shown.



The cells were cultured for 10 days and the cell count was recorded every 2 days.

The results are shown in the table.

Day	Cell count (thousand cells per cm ³)	
	Medium only	Medium + cytokines
2	22	36
4	50	130
6	330	760
8	520	1800
10	13	8200

- (i) Describe two differences in the cell count between the cultures.

2

1. _____

2. _____



3. (b) (continued)

- (ii) Calculate how many cells would be present in a 0.01 cm^3 sample taken from the culture containing cytokines after 10 days.

1

Space for calculation

_____ thousand cells

- (iii) The cell count was a viable cell count.

Use evidence from the table to support this statement.

1

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