

# Edexcel (B) Biology A-level

## 7.3 - Stem cells

### Flashcards

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# What is a stem cell?



# What is a stem cell?

Undifferentiated cells, that can divide and turn into other specific cell types.



Name and define the three types of stem cell.



Name and define the three types of stem cell.

1. Totipotent = can develop into any cell type including the placenta and embryo.
2. Pluripotent = can develop into any cell type excluding the placenta and embryo.
3. Multipotent = can only develop into a few different types of cell.



# How can embryonic stem cells be used in medicine?



How can embryonic stem cells be used in medicine?

To treat a variety of diseases e.g.  
Parkinson's, and replace damaged  
tissue e.g. nerve cells.



What is the main ethical issue around embryonic stem cell use?





What is the main ethical issue around embryonic stem cell use?

Embryos are killed in the process of extracting stem cells.



How do totipotent cells develop into other types of stem cell?



# How do totipotent cells develop into other types of stem cell?

Epigenetic modifications result in selective translation of the relevant parts of the DNA.

Totipotent cells develop into pluripotent cells in the early stages of embryonic development, and then later into fully differentiated somatic cells.



# How are induced pluripotent stem cells produced?



How are induced pluripotent stem cells produced?

From fibroblasts (fully differentiated connective tissue). Genes for transcription factors are inserted, and the cell regains the ability to differentiate into other types of cell.



Why is use of iPS stem cells favoured over embryonic stem cells?



Why is use of iPS stem cells favoured over embryonic stem cells?

More humane to produce. Less risk of infection when transplanted. Can be created in large numbers.

