

**Objective:** Understand the therapeutic value of stem cells

(Scottish curriculum: Higher biology Unit 1: the molecular biology of medicine; 2dii)

## About adult stem cells

Stem cells are one of the most amazing types of cells because they can (1) make copies of themselves and (2) make specialized cells like skin cells, red blood cells or liver cells.

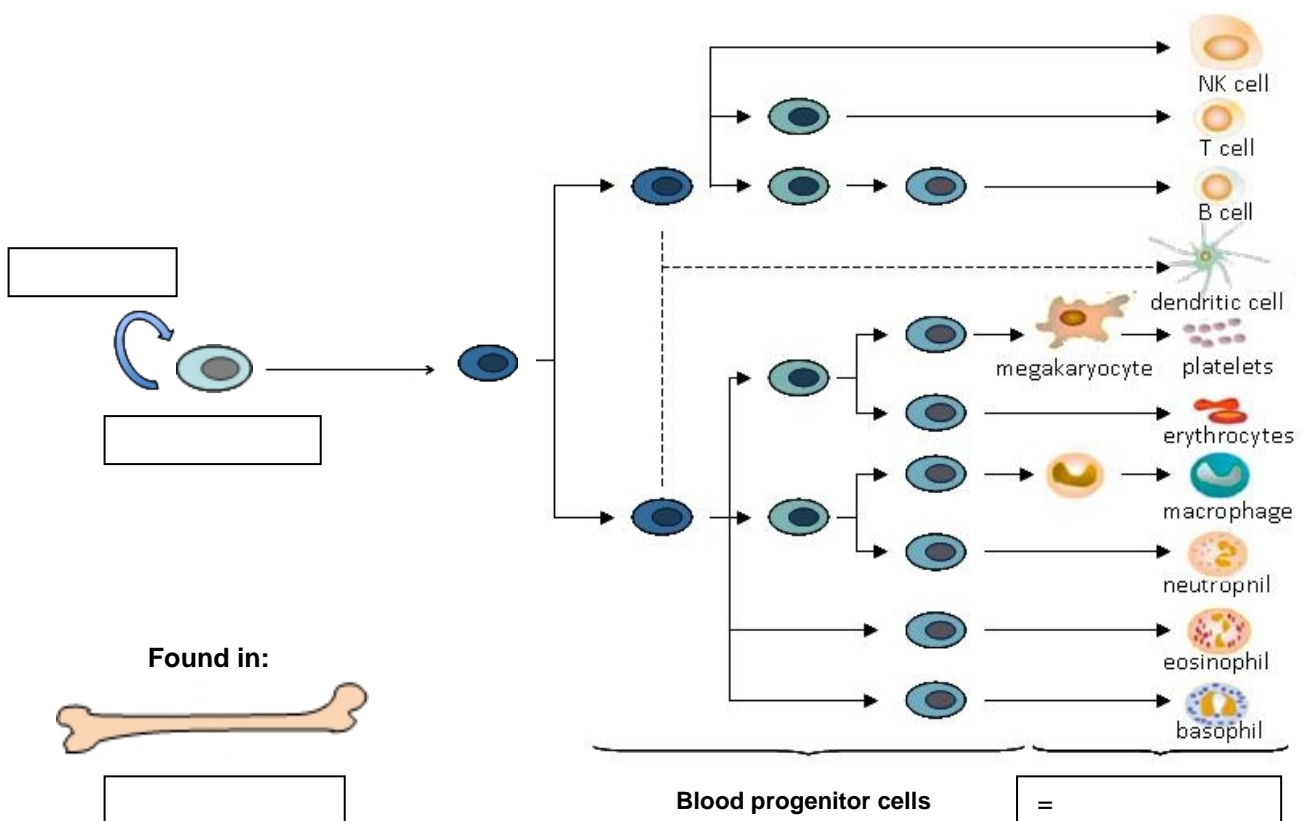
1. We need stem cells in our body. What would happen to you if you didn't have stem cells?

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Adult stem cells have the potential to make several types of specialized cells, but not all. For example blood stem cells can make all the different types of cells in your blood, but they can't make skin cells.


2. Add the following labels to the diagram:

a. specialized cells in blood; b. blood stem cell; c. make copies; d. bone marrow.



## Therapeutic value of stem cells

3. Read the article in the Scotland on Sunday.



AUGUST 2, 2009  
www.scotlandonsunday.com

### Award-winning researcher's stem cell study offers hope for Parkinson's cure

**Lyndsay Moss**  
Health Correspondent

A GROUND-BREAKING stem cell study being carried out in Scotland could finally lead to a cure for Parkinson's disease.

A researcher at Edinburgh University has been awarded £380,000 to create a special type of stem cell from patients with Parkinson's and their relatives.

It is hoped that cell lines created from just three families will help researchers around the world test new treatments for the disease.

And eventually the research could lead to patients receiving transplants of their own specially-treated cells to cure the condition.

Dr Tilo Kunath has been awarded a senior research fellowship by the Parkinson's Disease Society to push forward with his stem cell work.

In patients with Parkinson's, nerve cells in a particular part of the brain involved in coordinating movement die, leading to symptoms like tremors and problems walking.

In a UK first, Kunath and colleagues will create induced pluripotent stem cells (iPS cells) from people with Parkinson's to help understand why nerve cells die.

iPS cells are created by taking adult cells, such as from the skin, and reprogramming them in the lab to become cells which behave like embryonic stem cells - with the ability to transform into any type of cell, including nerve cells.

Scientists study stem cells for many reasons, for example to better understand the cell cycle and to develop and test new ways to treat patients.

4. Give one more reason why Dr Tilo Kunath is doing this research.

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In 2006, scientists discovered a new technique. They can now take a cell from a body, for example a skin cell, and turn it into a cell that behaves like stem cells from an embryo.

5. What are these special types of cells called?

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6. Why is Dr Tilo Kunath keen to use this technique to study Parkinson's?

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