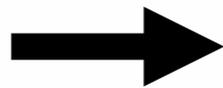


Cell Differentiation

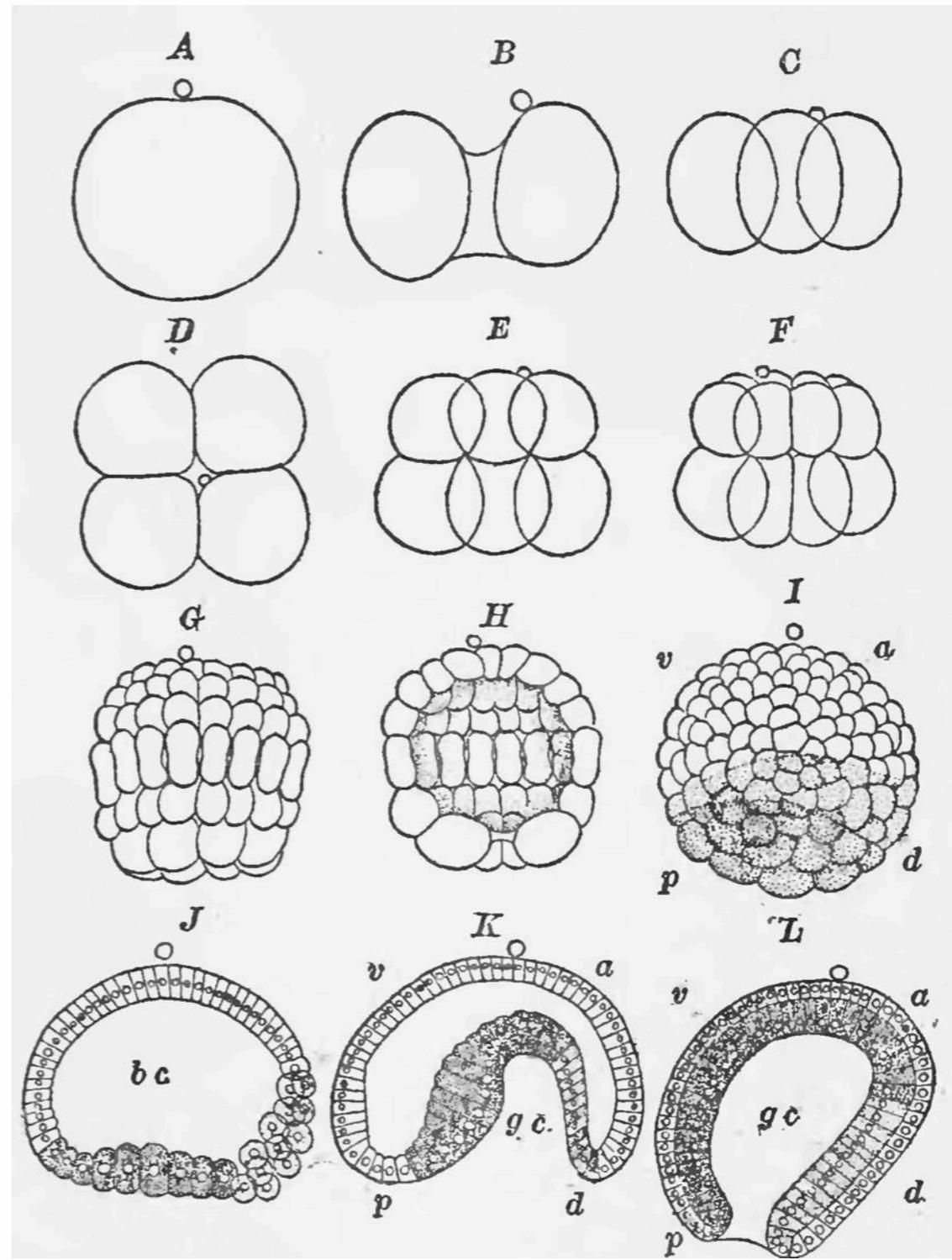
How did you get so big?

You started as a fertilized egg and now you are huge.



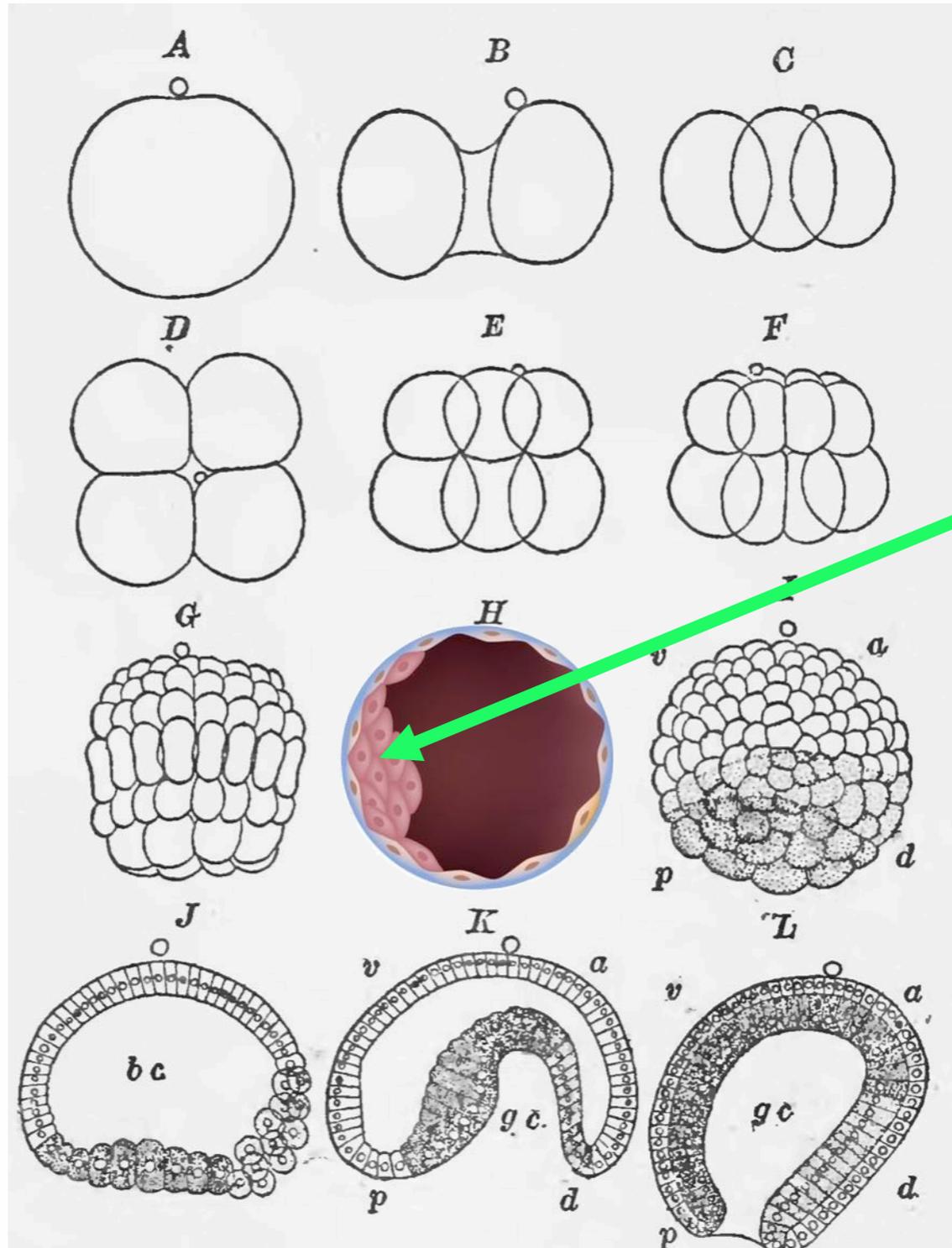
Your Cells Divided

You started as a zygote and that cell divided into two. Those two cells then divided into four and then those four cells divided and so on.



Stem Cells

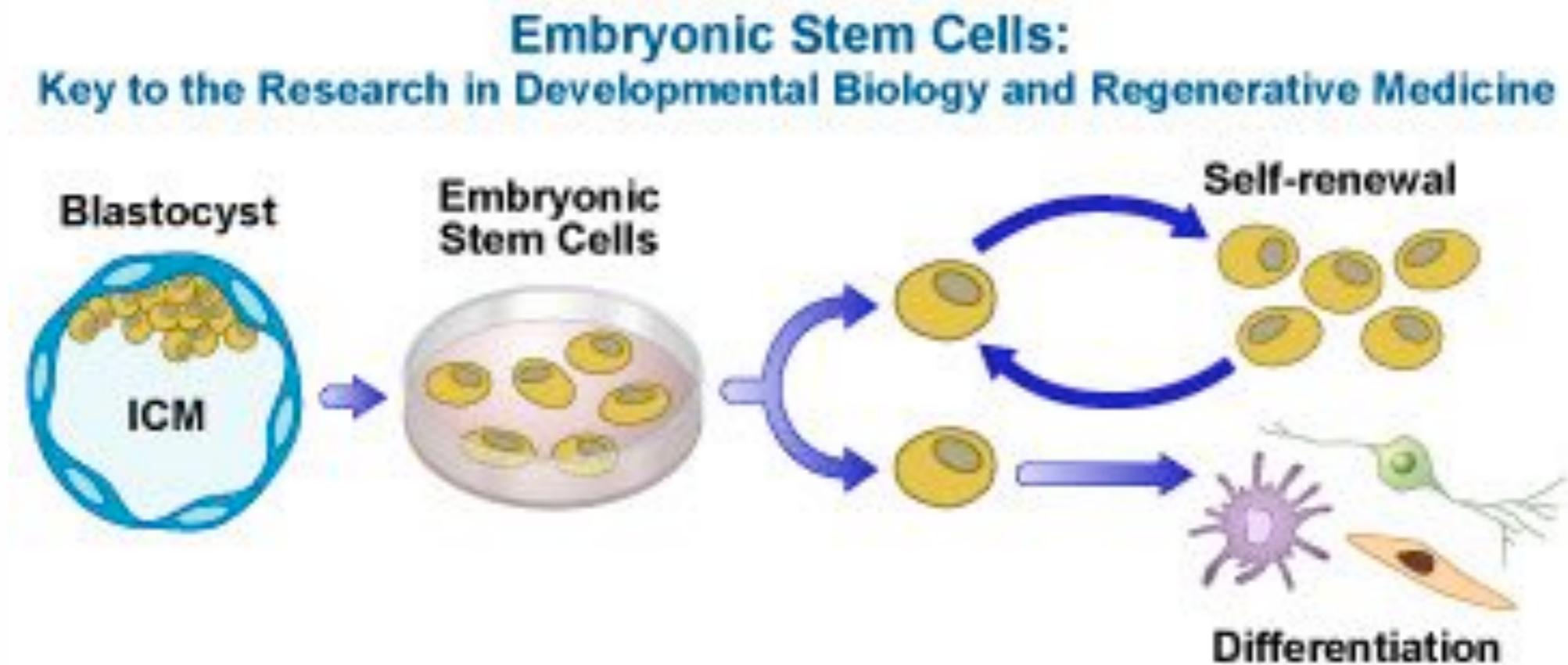
After about 4 days since conception, you started to form embryonic stem cells.



Embryonic
Stem Cells

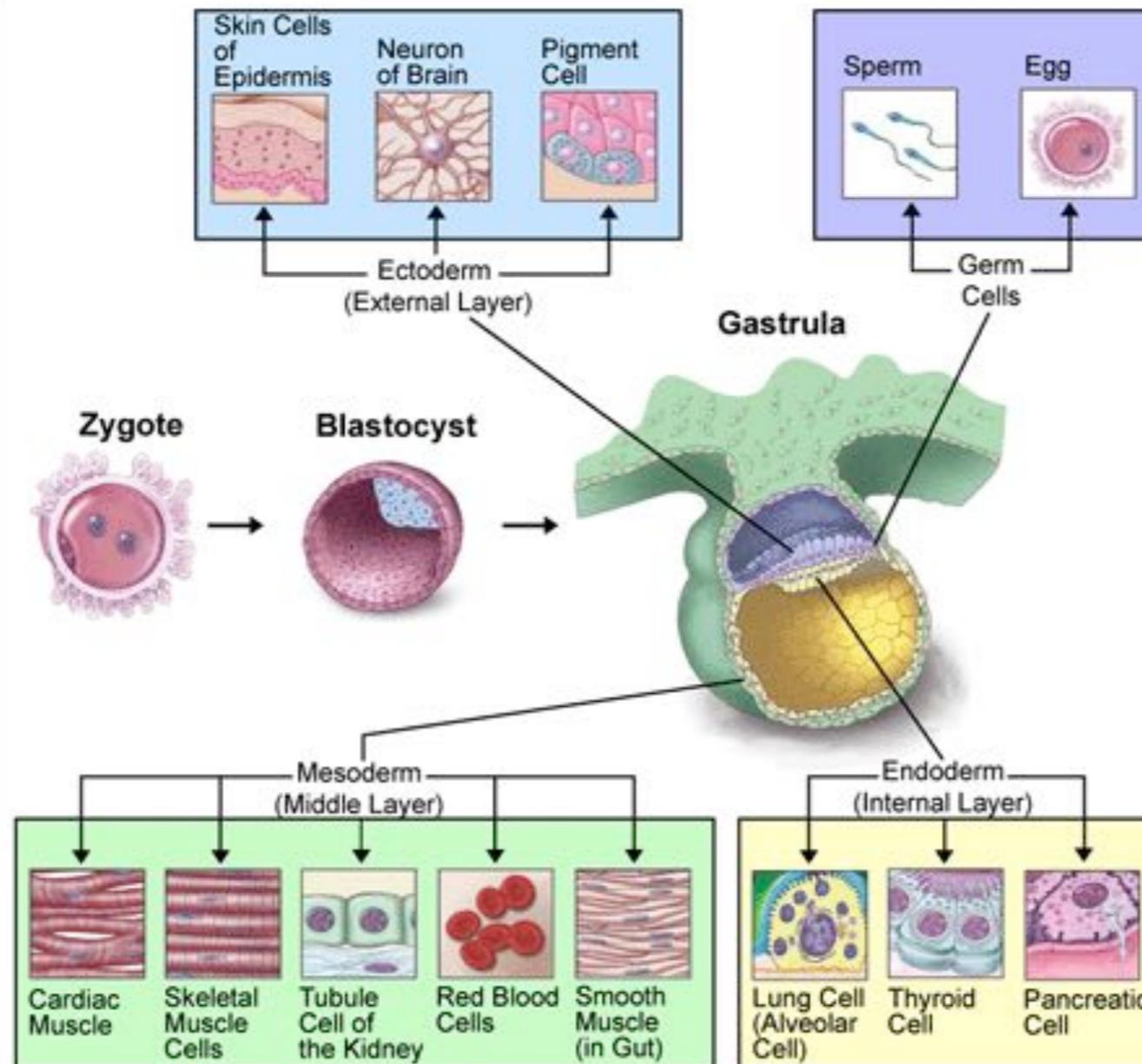
Embryonic Stem Cells

- Embryonic stem cells are called pluripotent stem cells.



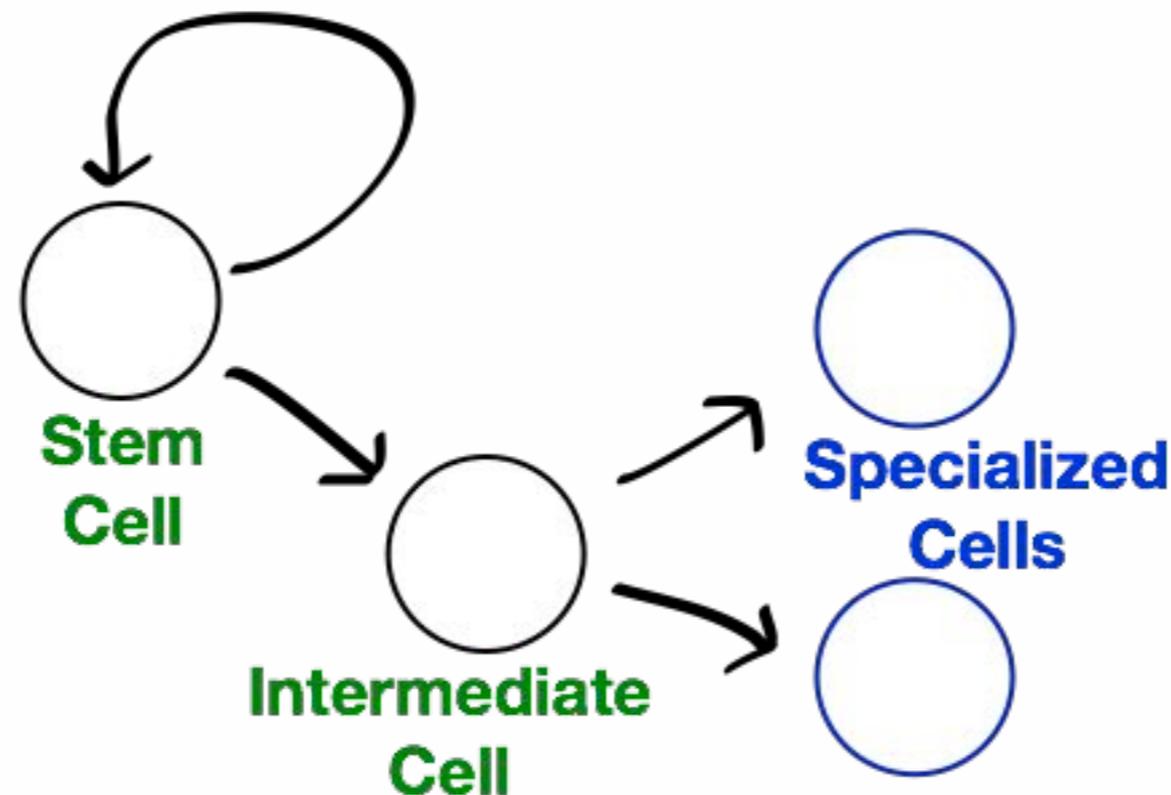
Pluripotent Stem Cells

- Pluripotent stem cells can turn into any cell in your body.



Differentiation

- When a stem cell divides, one of the two daughter cells will become specialized (usually using intermediates).
- Notice the stem cell will also create another stem cell.

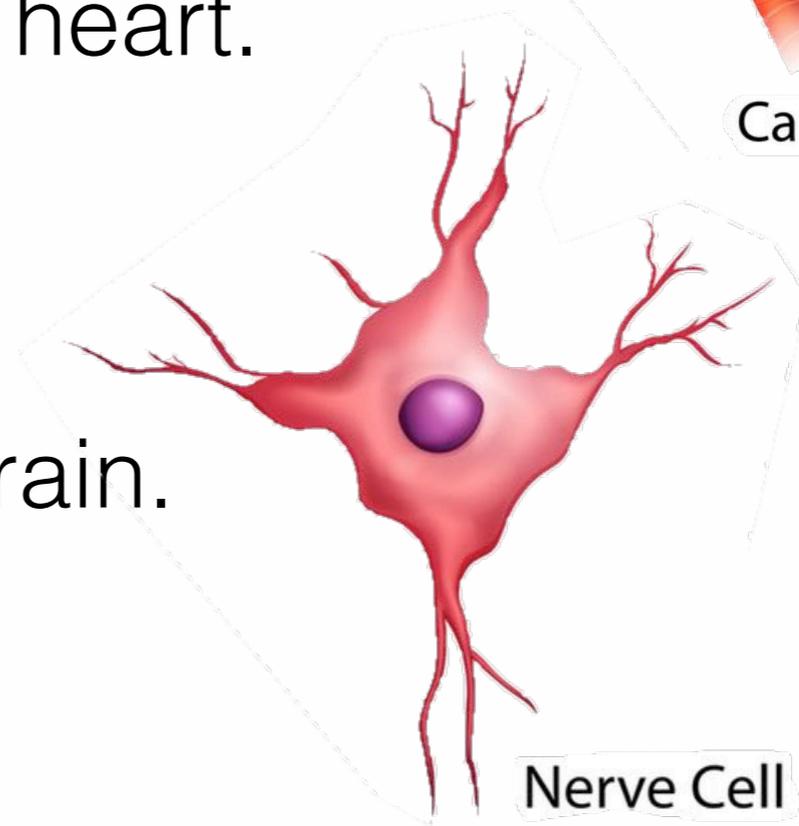


Specialized Cells

- A differentiated cell usually performs one specialized function.
- Specialized Cell Examples:
- Cardiac cells make up the heart.
- Nerve cells make up the brain.



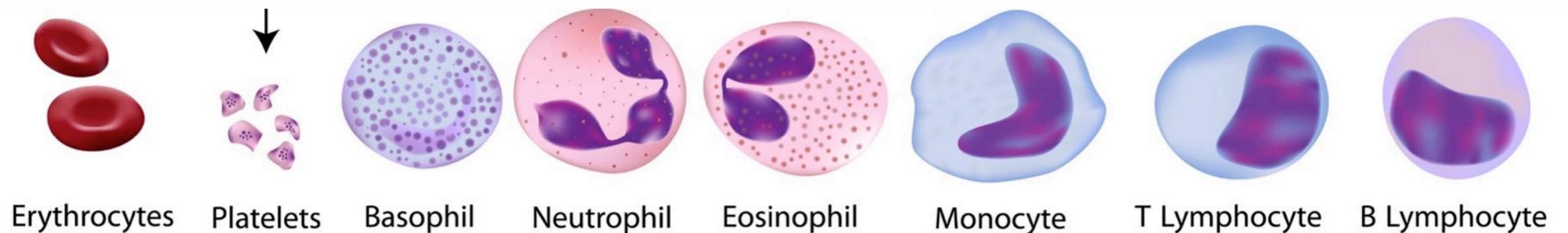
Cardiac Cell



Nerve Cell

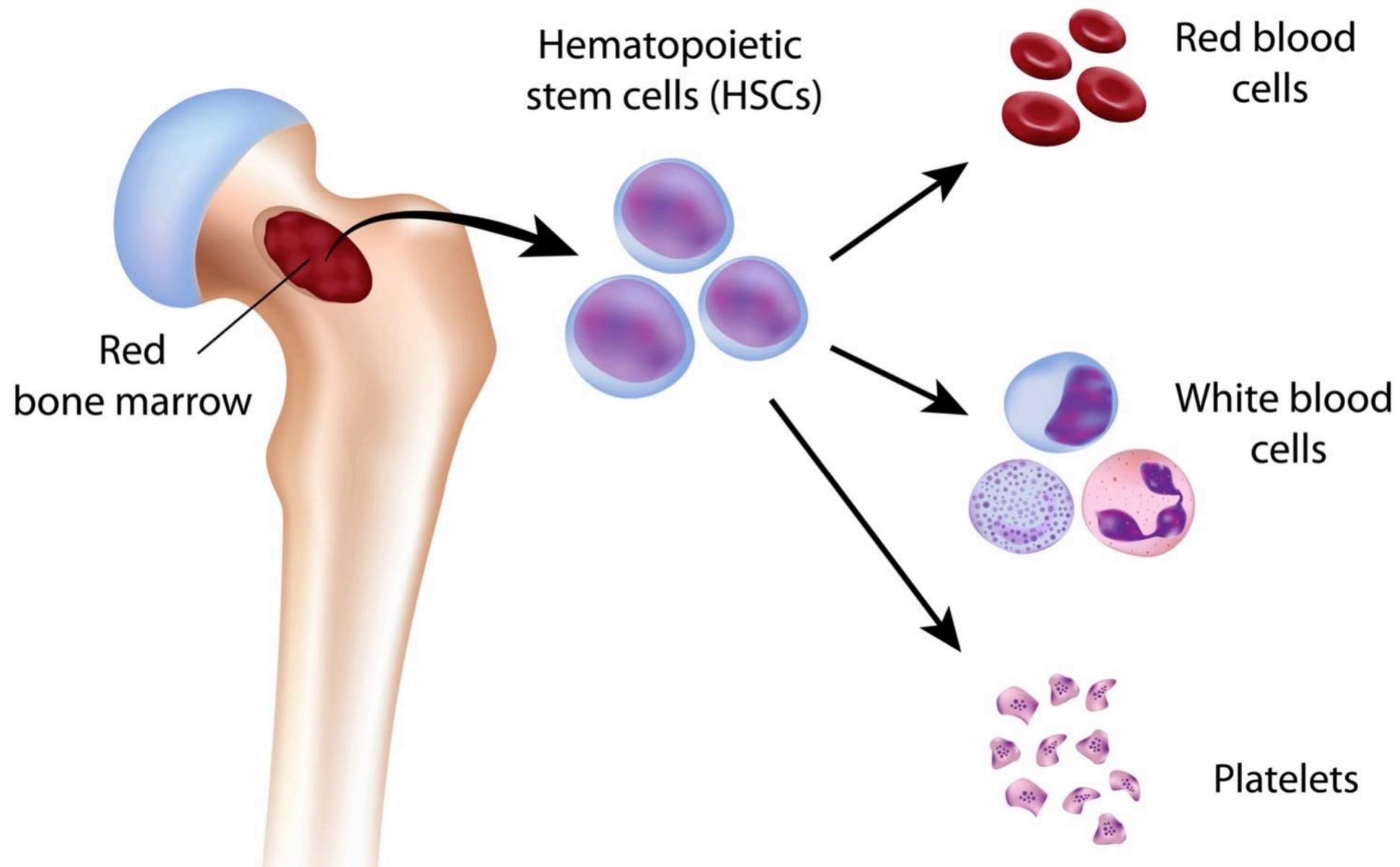
Adult Stem Cells

- Right now your body still has stem cells, just not pluripotent stem cells.
- Your have adult stem cells are usually multipotent; meaning they can create many different types of cells.



Example Adult Stem Cells

- Hematopoietic stem cells.



Question

- If you grow old, do you still have stem cells?

You Have Adult Stem Cells

- When you cut yourself, your skin stem cells will reproduce and grow new specialized skin cells.



Cell Division

- Stem cells and their intermediate cells are usually the only cells in the body that divide. (there are exceptions)
- Specialized cells are stuck in G0 because they can't pass the restriction checkpoint.

