

Growth, differentiation and stem cells

Which processes are involved in growth in animals?

Growth, differentiation and stem cells

Which processes are involved in growth in plants?

Growth, differentiation and stem cells

What is elongation in plants?

Growth, differentiation and stem cells

What is differentiation?

Growth, differentiation and stem cells

Why is differentiation important?

Growth, differentiation and stem cells

What is a percentile chart used for?

Growth, differentiation and stem cells

A child is on the 75th percentile for mass. What does this mean?

Growth, differentiation and stem cells

What is the equation for percentage change?

Cell division, elongation and differentiation.

Cell division and differentiation.

The process by which a cell becomes specialised for a particular job by gaining the structures it needs.

Cells getting longer, mostly by taking in water so that they expand.

To monitor the growth of a child by comparing their measurements with those of other children of the same age and sex.

It produces specialised cells, so a multicellular organism can have different cells doing different jobs.

$(\text{change} \div \text{original value}) \times 100$

75% of children of that age and sex have a lower mass, and 25% have a higher mass.

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What is a stem cell?

Growth, differentiation and stem cells

What is the function of embryonic stem cells?

Growth, differentiation and stem cells

What is the function of stem cells in adult animals, such as in bone marrow?

Growth, differentiation and stem cells

What is the function of meristems in plants?

Growth, differentiation and stem cells

Give two potential benefits of using stem cells in medicine.

Growth, differentiation and stem cells

Give two risks of using stem cells in medicine.

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Why do some people object to embryonic stem cell research?

They can differentiate into any type of cell, producing all the specialised cells of the developing embryo.

An undifferentiated cell that can divide and can differentiate into specialised cells.

Found at root and shoot tips, they produce cells that can differentiate into any type of plant cell, so the plant keeps growing.

They replace damaged or worn-out cells. They can differentiate into only a limited range of cell types, for example blood cells.

Tumour formation, and transfer of viruses from donor cells. Also immune rejection.

Treating conditions such as diabetes or paralysis, and replacing damaged cells with healthy ones.

Embryos are used, and some people have ethical or religious objections to this.