

# Stem Cells

## What are stem cells ?

An undifferentiated cell of a multicellular organism which is capable of giving rise to indefinitely more cells of the same type, and from which certain other kinds of cell arise by differentiation

## Embryonic

On the inside layer of an embryo

Undifferentiated

Can produce all the specialised cells in the body

## Adult

Bone marrow

Limited ability to differentiate

Produces mainly cells of the blood

Skin

Limited ability to differentiate

Produces cells found in different layers of the skin

Other organs such as brain and liver

Limited ability to differentiate

Produces cells found in these organs

Umbilical cord blood

Limited ability to differentiate

Produces cells of the blood, muscle and nerve tissue

## Meristem

Tips of roots and shoots

fully undifferentiated

One cell can divide and produce a whole new plant

## Animals v Plants

Animals

Embryonic stem cells help to form all of the different tissues and organs

Adult stem cells replace cells lost through damage to produce new cells for growth

Plants

Meristem cells can differentiate into the cells needed by the plant in regions where growth is occurring

Meristem cells in the roots can differentiate into root hair cells

Stem cells keep the ability to differentiate into any type of plant cell throughout the life of the plant