

- Smaller cells are more efficient in transporting nutrients and waste than bigger cells, because their surface area is big compared to their volume
 - Big cells have large volume, but relatively small surface area. Therefore, they need a lot of nutrition and have a lot of waste

But not all cells follow this norm

- Some cells have evolved into different shapes
 - Cells that are large in size have modifications that allow them to function efficiently
 - Changes in shape, in- or out- foldings => increase of surface area
 - Some atypical examples
 - Striated muscles => flat and long rather than spherical
 - Giant algae => interconnected with each other with small openings
 - Acetate fungal hyphae => the roots of a certain fungi, physically connected with each other, however they have their own organelles

Stem cells

- Stem cells are the cells that retain their ability to divide and differentiate into various types of cells
- Plants have also stem cells in regions of meristematic tissue (near roots and stem tips)
- Stem cells cannot be distinguished by their appearance. They need to be isolated from other cells on the basis of their behaviour
- There are 2 types
 - Embryonic stem cells
 - Come from undeveloped embryos
 - When they divide to produce a tissue they also produce daughter cells that stay stem cells
 - Pluripotent
 - Can differentiate into any kind of cell and even create a complete organism
 - Adult stem cells or tissue-specific stem cells
 - Can turn into one type of tissue
 - For example, blood cells can turn into red or white blood cells or blood platelets

Pluripotent stem cells

- Could heal many diseases
 - Alzheimer's, Parkinson's and diabetes