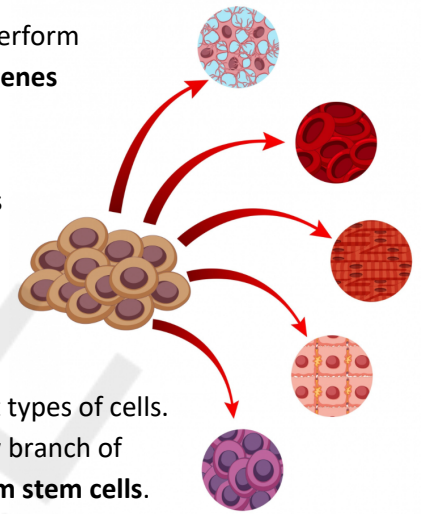


Biology GCSE: Cell Organisation

Cell Differentiation: structural differences between types of cells enables them to perform **specific functions** within the organism. These differences in cells are **controlled by genes in the nucleus**

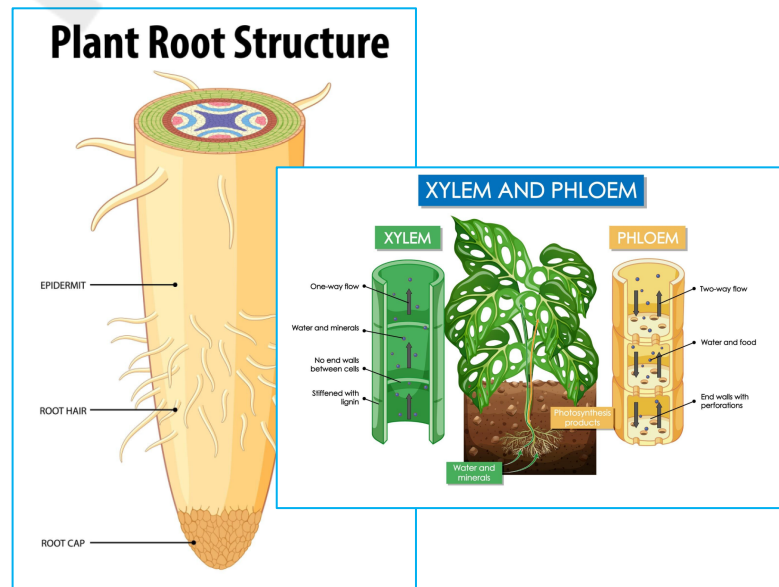
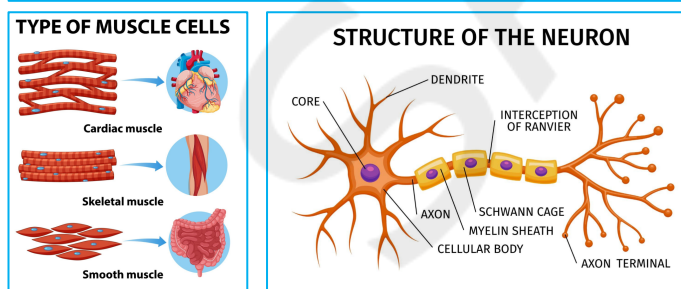
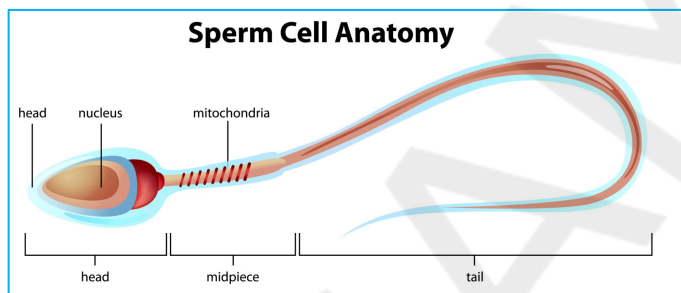
Cell Specialisation: the process where an **unspecialised cell** like a stem cell develops into a **specific cell type with a unique structure and function** enabling multicellular organisms to perform diverse tasks efficiently

Stem Cell Research: If cells are isolated at an early stage of growth before they have become too **specialised** they can retain their ability to grow into a range of different types of cells. This phenomenon has led to the development of **stem cell technology**. This is a new branch of **medicine that allows doctors to repair damaged organs by growing new tissue from stem cells**.



Examples of specialised cells:

- ⇒ **Sperm cells:** male zygotes **carrying DNA to the egg**, with a **specialised tail** and loads of **mitochondria** to swim
- ⇒ **Nerve cells:** specialised for **rapid signalling**, these **long** cells have **branched connections in a network** covering the whole body
- ⇒ **Muscle cells:** specialised for **contraction** with lots of **mitochondria** for energy
- ⇒ **Plant Root hair cells**
- ⇒ **Plant phloem and Xylem cells:** specialised to **transport substances** (often vertically) in a plant



Cell Organisation: the hierarchical **arrangement of specialised cells into increasingly complex structures** in multicellular organisms

Multicellular organisms are made up of Organ Systems

- ⇒ **Similar cells are organised into tissues**
- ⇒ **tissues are organised into organs**
- ⇒ **organs are organised into Organ Systems**

