Introduction to the cell

Learning Objectives

- Outline the basic functions of a cell
- Describe the structure of the cell membrane and outline its functions
- Identify the different types of membrane protein and outline their function
- Identify the different types of membrane carbohydrates and outline their function
- Explain the difference between passive and active transport
- Describe the following types of passive transport: diffusion; osmosis and facilitated diffusion
- Describe primary and secondary active transport
- Describe the following types of vesicular transport: endocytosis and exocytosis
- Describe the basic structure and function of the following organelles: ribosomes; endoplasmic reticulum; Golgi apparatus; lysosomes and mitochondria

Introduction

Cell function is dependent on the **metabolism** of the cell. Metabolism is a term that covers all biochemical reactions within the body and can be subdivided into anabolic processes (anabolism - uses energy to generate complex molecules from simpler subunits) and catabolic reactions (catabolism – break molecules into simpler products, releasing energy). Cells must maintain a stable internal environment (homeostasis) to preserve the particular function of the cell type.

Although the **structure of the cell is closely related to its function** (and structures vary greatly throughout the body), there are certain structure, transport mechanisms and metabolic reactions common to all cell types in the body.

Cell membranes

Both prokaryotic and eukaryotic cells are surrounded by a plasma membrane. This plasma membrane defines the cell boundaries, maintains essential differences between cell cytosol and extracellular environment, allows cell to grow and gives it the capability to move.

For a cell to survive and grow, the plasma membrane must allow nutrients to enter and waste products to exit the cell. To facilitate this exchange, the membrane is penetrated by proteins which function has highly selective channels and transporters. Other proteins in the membrane can respond accordingly. Without membranes there would be no life.