5.1 Homeostasis

homeostasis	the regulation of the internal conditions of a cell or organism to maintain optimum conditions for function in response to internal and external changes

In the human body, homeostasis controls :
· blood glucose concentration
· body temperature
· water levels

These automatic control systems, involving **nervous responses** & **hormonal (chemical) responses**, detect changes and respond to them.

All control systems include :
· **receptors** - cells that detect *stimuli* (changes in the environment)
· **coordination centres** - receive and process information from receptors, e.g. brain, spinal cord, pancreas
· **effectors** - muscles or glands that bring about responses to restore optimum levels

5.2.1 Structure and Function

The nervous system enables humans to react to their surroundings and to coordinate their behaviour.

neurone adaptations	· long axon - can travel long distances in the body · myelin sheath - insulates axon -> increases speed of nerve impulses · dendrites - branch from dendrons ; receive incoming nerve impulses from other neurones

stimulus > receptor > coordinator > effector > response

· Information from *receptors* passes along cells (neurones) as electrical impulses to the *central nervous system* (CNS)
· The CNS (brain & spinal cord) coordinates the response of *effectors* which may be muscles contracting or glands secreting hormones

reflexes	automatic responses which occurs unconsciously

The information travels down a **reflex arc**, allowing vital responses to take place quickly.
These impulses do not pass through the conscious part of the brain.

· When a *stimulus* is detected by *receptors*, impulses are sent along a **sensory neurone** to the CNS
· In the CNS the impulse passes to a **relay neurone** from a sensory neurone via a **synapse***
· Impulses are passed onto a **motor neurone** from a motor neurone via another synapse*
· The impulse reach an *effector* resulting in an appropriate response (quicker than normal)

synapse	the connection/gap between two neurones
*	· The electrical impulse is transferred by chemicals which diffuse across the gap · These chemicals then set off a new electrical impulse in the next neurone.

stimulus > receptor > sensory neurone > CNS > motor neurone > effector > response

reaction time	- how long it takes you to respond to a stimulus - can be measured with the ruler drop test

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5.2.2 The Brain

5.2.3 The Eye