

- *Controlled variable* : any physical or chemical property that might vary and must be controlled to maintain homeostasis (e.g., temperature, blood pressure)
- *Sensor* (receptor) : monitors current controlled variable state/value and sends information to control centre
- *Control centre* : receives input from sensor, compares value to set point, then signals the effector/s if necessary to counteract imbalance
- *Effector* : the site of action, takes action to correct the imbalance, based on information from the control centre. There may be multiple effectors for one controlled variable.

Example: negative feedback helps maintain core body temperature

- Controlled variable = body temperature
- Sensors = temperature sensors in the skin and internal organs. These constantly transmit information to the hypothalamus.
- Control centre = hypothalamus. The hypothalamus also controls hunger, thirst, hormone release etc. The hypothalamus sends out nerve impulses to the effectors.
- Effectors:
 - o Blood vessels - constrict to conserve heat when body temperature is low
 - o Sweat glands - activated when body temperature is high
 - o Skeletal muscles - repeatedly contract/shiver when body temperature is low to generate heat
- *Hypothermia* : hypothermia occurs where the body temperature drops so much that homeostasis is insufficient for restoring body temperature to normal temperature.
 - o Normally when body temperature drops, shivering and vasoconstriction are sufficient to restore normal body temperature.
 - o In hypothermia, these responses weaken or stop, as the core temperature is so low that the negative feedback system stops working.

Problem-based learning questions

1. Which one of the following is TRUE regarding skin?
 - Beneath the dermis is the basement membrane, which separates the dermis from the hypodermis
 - False
 - Apparently the fact we haven't talked about this means we can just write this question off lol
 - The basement membrane separates the epidermis from the dermis
 - Keratin is a protein in the cells of the epidermis that provides strength and waterproofing
 - False: doesn't provide strength, although it does provide waterproofing
 - Melanocytes and keratinocytes are two skin cell types that are prevalent in the dermis
 - TRUE
 - The sebaceous glands and the sweat glands are two types of endocrine glands located in the dermis
 - Endocrine (inside body, circulates stuff within body) whereas these glands are exocrine (release stuff externally)
 - Melanocytes produce calcium, which strengthens the skin
 - False - melanin
2. Each of these organ systems is involved in the homeostatic regulation of body temperature EXCEPT