Control Mechanisms of the Endocrine System

The endocrine system works to maintain homeostasis.

Homeostasis is maintained by negative feedback, or feedback inhibition.

In this process, stimuli initiate responses that oppose the original stimulus.

Similar to your home's heating system:
When it's cold, the thermostat sensor initiates the production of heat, and when the temperature is high it inhibits the production of heat.

The temperature change in the environment feeds back to the thermostat to inhibit the furnace.

1. Hypothalamus senses a drop in Thyroxine in the blood and will secretes TRH (*thyrotropin-releasing hormone*).
2. TRH stimulates the pituitary gland to produce TSH (*thyroid-stimulating hormone*)
3. TSH stimulates the thyroid to produce thyroxine.
4. High levels of Thyroxine inhibits the production of TRH, thus ending the cycle.

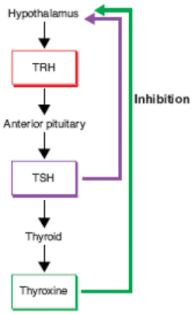


Fig. 39 - 4, p. 1000

What controls the control system?

Controlling metabolism:

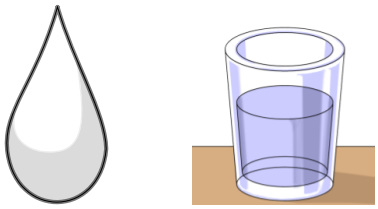
Metabolism is the sum total of all chemical reaction in the body.

Metabolism is increased by Thyroxine, a hormone produced by the thyroid.

The thyroid doesn't choose how much thyroxine to produce on its own, but rather it relies on a negative feedback mechanism.

Task:

Read page 1001 and explain the feedback inhibition process that controls the balance of water in the body.



Other control mechanisms

The endocrine system also uses complimentary hormone actions, where hormones with opposite effects are created to keep processes in balance (*much like accelerator and brake pedals in a car*).

ex: calcium control:
Calcitonin increases levels of calcium in blood
PTH decreases it.