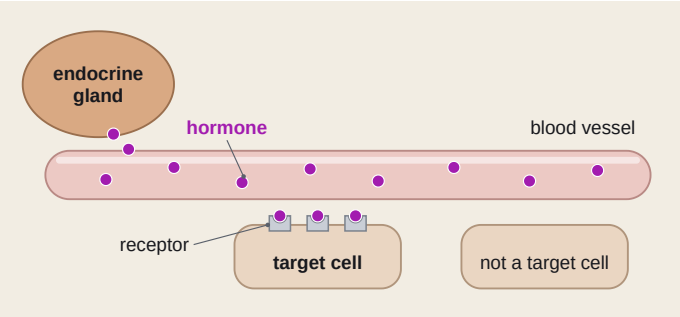
A10 · Hormones, feedback and the endocrine glands · Notes

Goals: Say what a hormone and a target cell are. Compare the nervous system and the endocrine system. Explain negative feedback and positive feedback. Trace a negative feedback loop. Find the main endocrine glands and name their hormones. Explain how the hypothalamus controls the pituitary gland.

Name: _____ Date: _____

Slide 1 of 7 · Hormones and target cells

In lesson A1, the body had two systems that keep homeostasis. Lessons A1 to A9 covered the nervous system. Today you start the endocrine system.



	Nervous system	Endocrine system
Signal	action potentials	hormones
Carried by	neurons	the blood
Speed	fast	slower
Effect lasts	a short time	longer

Key ideas

An endocrine gland releases a _____ into the blood.

Only _____ respond. They have _____ that the hormone fits.

The endocrine system is _____ than the nervous system, and its effects last longer.

Example

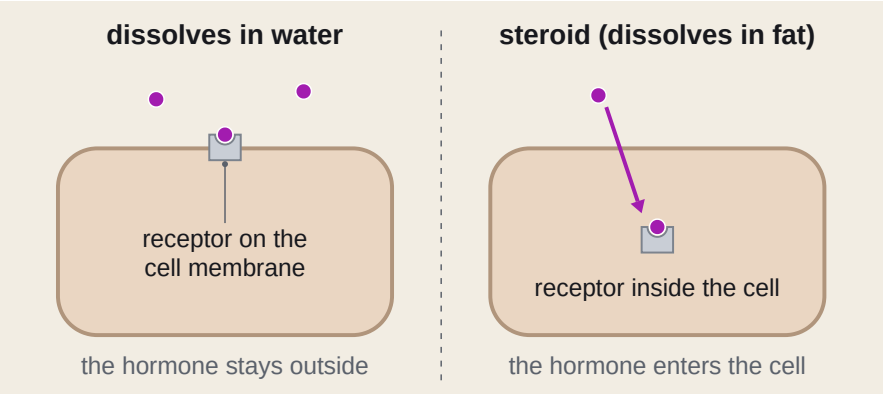
A hormone reaches every cell in the body. Explain why only some cells respond.

Try it

Give two differences between the nervous system and the endocrine system.

Slide 2 of 7 · Two kinds of hormone

On the last slide, a hormone fitted a receptor on its target cell. Where that receptor is depends on the kind of hormone.



Key ideas

Most hormones dissolve in _____. They attach to a receptor on the _____ of the cell.

Other hormones are _____. A steroid dissolves in fat.

A steroid passes through the cell membrane. Its receptor is _____ the cell.

Example

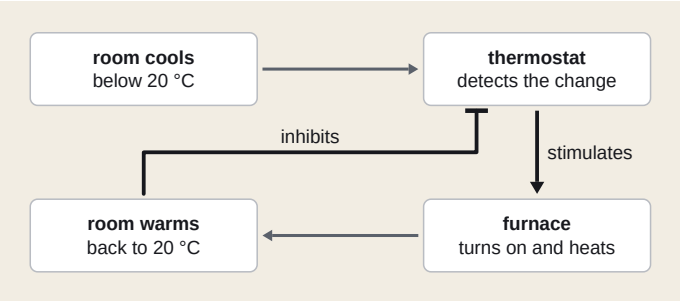
Explain why a steroid hormone can enter a cell.

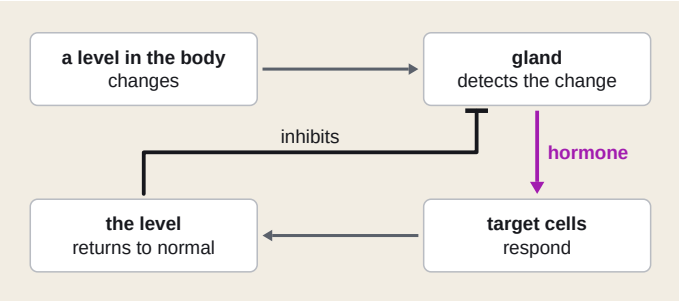
Try it

State where a hormone that dissolves in water attaches.

Slide 3 of 7 · Negative feedback

On slide 1, a gland released a hormone and target cells responded. Something must tell the gland when to stop. That control is called feedback.





Key ideas

A change causes a _____.

The response brings the level back to _____.

The normal level _____ the gland.

This is _____.

Example

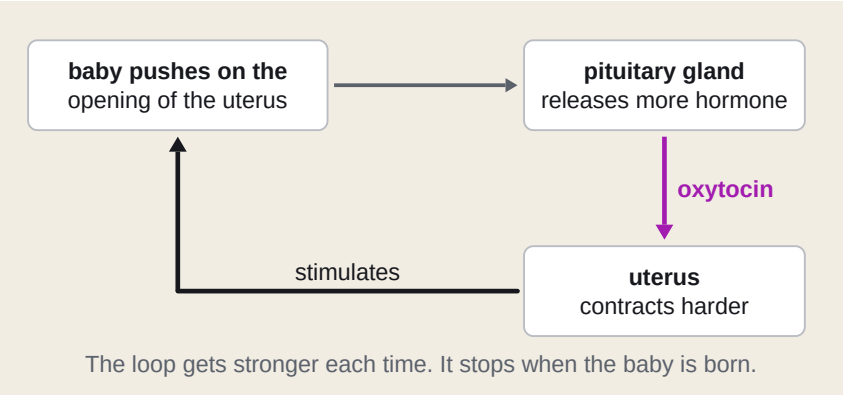
A room cools below 20 °C and the furnace turns on. State what turns the furnace off.

Try it

Compare the response with the change that started it, in negative feedback.

Slide 4 of 7 · Positive feedback

On the last slide, negative feedback reversed a change. A few loops in the body do the opposite: they make the change bigger.



The loop gets stronger each time. It stops when the baby is born.

Key ideas

In _____, the response _____ to the change.

In childbirth, the hormone _____ makes the uterus contract harder.

The loop stops when the baby is _____.

Example

Explain how you can tell that the childbirth loop is positive feedback.

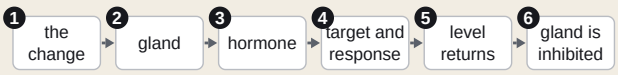
Try it

State what positive feedback is useful for.

Slide 5 of 7 · Method: trace a negative feedback loop

Every hormone in this unit is controlled by a loop like the furnace and thermostat. These six steps trace any of them.

1. **Name** the level that changed, and which way.
2. **Name** the gland that responds.
3. **Name** the hormone it releases.
4. **Name** the target, and state what it does.
5. **State** how the level changes back.
6. **State** what this does to the gland: it is inhibited.



Check: the response is opposite to the change.

Used again in: lessons A11 to A14

Key ideas

Step 1: name the _____ that changed. Step 2: name the _____.

Step 3: name the _____. Step 4: name the target and what it does.

Step 5: the level changes back. Step 6: the gland is _____.

Example

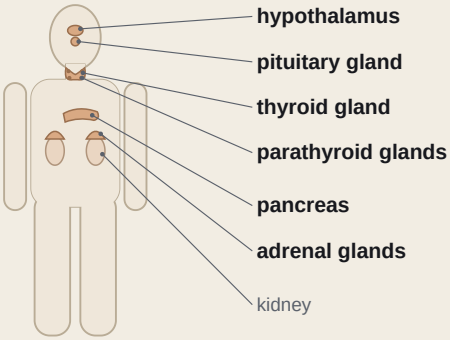
Use the six steps for a furnace and thermostat when the room cools.

Try it

Hormone X raises the level of a substance. The level falls below normal. Use the six steps to predict what happens to hormone X.

Slide 6 of 7 · The endocrine glands

So far a "gland" has been a box on a loop. Now you meet the real glands and see where each one is.



Gland	Hormones in this unit
pituitary gland	hGH, TSH, ACTH, ADH
thyroid gland	thyroxine, calcitonin
parathyroid glands	PTH
adrenal glands	epinephrine, cortisol, aldosterone
pancreas (islet cells)	insulin, glucagon

Key ideas

The _____ is in the head, below the hypothalamus.

The _____ is in the neck, with four _____ on it.

One _____ sits on top of each kidney.

In the pancreas, the _____ make hormones.

Example

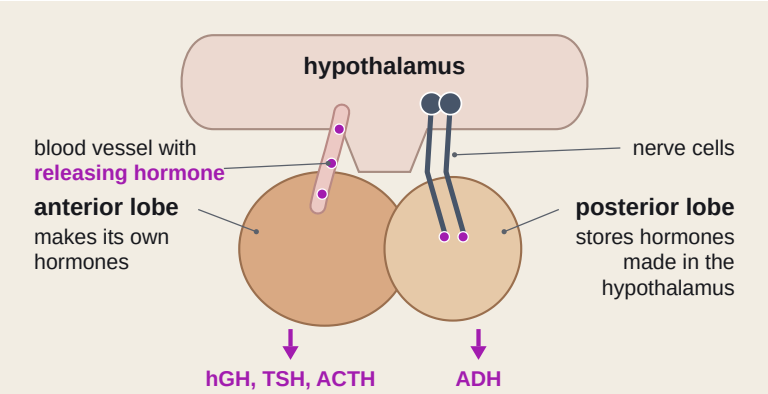
Name the gland that releases each hormone: insulin, and thyroxine.

Try it

Name the gland that releases each hormone: epinephrine, and PTH.

Slide 7 of 7 · The hypothalamus and the pituitary gland

On the last slide, the pituitary gland released four hormones. It does not act alone: the hypothalamus controls it.



Key ideas

The _____ stores hormones that the hypothalamus makes. ADH is one.

The _____ makes its own hormones: hGH, TSH and ACTH.

The hypothalamus sends _____ to the anterior lobe.

Example

Name the lobe of the pituitary gland that stores hormones made in the hypothalamus.

Try it

Explain why the pituitary gland is called the master gland. Name what controls it.