

GCSE Biology – Hormones - Transcript

What do the speed of our metabolism, the fight or flight response and going through puberty have in common? A lot is down to our hormones.

Hormones are chemical messengers made by glands in the body. They're released into the bloodstream and move throughout the body. When they reach their target organ they have a specific effect.

They usually work more slowly than nervous system responses but their effects can last much longer. All the glands together make up the endocrine system. These glands release hormones.

This is one way that the internal conditions in the body are kept constant. We call this homeostasis.

The endocrine system responds to internal changes through a process, or mechanism, called negative feedback. In general this means that if something rises, then it's reduced. And if it reduces, then it's raised.

So how does it work? At the top of the body, inside the brain is the pituitary gland - the 'master gland'. It controls other glands by releasing hormones to tell them when to release their own hormones.

It also releases ADH, or anti-diuretic hormone, which controls water levels in the blood. When a person is dehydrated, more ADH is released and the kidneys keep more water.

This means less urine is made. When a person drinks too much, less ADH is released and the kidneys retain less water, which means more urine is produced.

The thyroid gland controls the metabolism, how fast reactions occur in the body, by releasing thyroxine. This increases the metabolic rate.

So if metabolism is too slow, the thyroid gland releases thyroxine, returning it to normal. The adrenal glands produce adrenaline, an unusual example of a hormone that acts very quickly.

Adrenaline prepares the body for action: the fight or flight response. The pancreas controls blood sugar levels by releasing insulin and glucagon.

When blood sugar levels are too high, insulin is released which stimulates the body to store glucose in the liver and muscles by converting it to glycogen.

When blood sugar levels drop, glucagon is released to convert glycogen back into glucose, increasing blood sugar levels again. The testes release testosterone and ovaries release oestrogen. These trigger the physical changes seen in puberty.

So, from controlling growth, to how our bodies respond to stress, Hormones keep everything working in balance.