

This is the **Higher Separate** version — includes all Higher Tier content (marked ★) and all Separate Science content.

The endocrine system uses chemical messengers called hormones, carried in the blood to target organs. It works more slowly than the nervous system but produces longer-lasting effects.

- Hormones are secreted by endocrine glands directly into the blood.
- They travel in plasma to target organs — cells with specific receptors for that hormone.
- Key glands: pituitary (master gland), thyroid, adrenal glands, pancreas, ovaries, testes.
- Pituitary: produces FSH, LH, ADH, growth hormone — controls other endocrine glands.
- Thyroid: produces thyroxine — controls metabolic rate.
- Adrenal glands: produce adrenaline — fight or flight response (increases heart rate, dilates pupils, redirects blood to muscles).
- Nervous system vs endocrine: nerves = fast, short-lived, specific target. Hormones = slower, longer-lasting, widespread effect.

★ **HT Negative feedback:** the response to a hormone reduces further hormone release — maintains homeostasis.

### Key Terms

<b>Hormone</b>	A chemical messenger secreted by an endocrine gland into the blood — affects target organs
<b>Endocrine gland</b>	A gland that secretes hormones directly into the bloodstream (ductless)
<b>Target organ</b>	An organ with specific receptors for a particular hormone
<b>Adrenaline</b>	Hormone from adrenal glands — prepares body for fight or flight
<b>Negative feedback</b>	A control mechanism where the response reduces further secretion of the hormone

■ **Exam Tip:** Nervous system vs endocrine: FAST, SPECIFIC, SHORT = nervous. SLOW, WIDESPREAD, LONG-LASTING = endocrine. This comparison comes up often in 4-mark questions.