

Hormones, stress and behavioural regulation

Supported GRE teaching and original transfer practice

Identify the evidence

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Trace the HPA stress response from trigger to cortisol

Use the overview measurement lesson VI for research inference.

Concepts 1 (1)

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The stress response runs on two clocks. The fast sympathetic-adrenal-medullary path releases adrenaline within seconds; the slower HPA axis runs hypothalamus (CRH) to pituitary (ACTH) to adrenal cortex (cortisol) over minutes, mobilising energy and suppressing non-urgent functions. Chronic stress can affect health through several interacting pathways; cortisol is one part of this regulation, not a single inevitable cause.

Concepts 1 (2)

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Key regulatory hormones: progesterone prepares and maintains the uterine lining for implantation; oxytocin drives labour contractions and milk let-down and is linked to bonding; melatonin times sleep-wake cycles; insulin and glucagon manage blood glucose in opposition. Match the hormone to the loop it serves, not to a vague mood label.

Concepts 2

Concepts 2

Hormones differ from neural signals in timing and targeting: neural signalling is often faster and spatially directed; hormonal signalling often acts over longer times through circulation. These are tendencies with exceptions, not an absolute division. Only cells carrying the matching receptor respond, so a circulating hormone can still be selective.

Feedback keeps the system bounded: cortisol inhibits CRH and ACTH release (negative feedback), so the axis ramps down when the stressor passes. Feedback failure or chronic activation — not the hormone itself — is what turns an adaptive response into a liability.

Reason through the worked case

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Order CRH, ACTH and cortisol by their place in the HPA pathway, then explain negative feedback without calling cortisol harmful in itself.

Hypothalamus releases CRH, which stimulates pituitary ACTH, which stimulates adrenal-cortex cortisol. Cortisol can inhibit upstream signalling, helping regulate the response. This adaptive control differs from saying the hormone is always harmful. Repeated activation, context and regulation matter.

Read the reviewed representation

HPA axis: the slower stress cascade



Original schematic for Hormones, stress and behavioural regulation. Illustrative relationships and numbers are not research results.

Attempt an unfamiliar case

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A hormone reaches many organs but affects only some cells. Explain why broad circulation and selective effects are compatible.

Pause and write the explanation before continuing.

Check the transfer argument

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Blood distributes the signal widely, but cells need suitable receptors and downstream machinery to respond. The presence of hormone alone does not establish the same effect in every tissue. A useful investigation measures receptor context and a specified response, rather than inferring behaviour directly from a circulating concentration.

Accept a different explanation when its evidence and limits are justified.

Limit the conclusion

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Assigning a hormone a single emotion, or forgetting receptor selectivity; hormones broadcast but only receptor-bearing cells answer.

Original classroom cases are not official questions or personal clinical advice.

Check yourself

Independent retrieval

A stress marker rises alongside sleep loss. What design would distinguish their contributions to performance?

Write your reasoning before comparing it with the methods and limits taught in this lesson.