

Exercise walk-through

25.1

Hormones, stress and behavioural regulation: evidence and transfer

GRE · GRE Subject Test · GRE Psychology

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 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.

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.

Exercises 2.1·2.2

2.1 The hormone responsible for preparing the uterus for implantation of a fertilised ovum is: [1]

A. melatonin B. progesterone C. adrenaline D. insulin E. cortisol

2.2 Compared with neural signalling, hormonal signalling is: [1]

A. faster and more focal B. slower and body-wide C. shorter in duration D. independent of receptors E. limited to the brain

Exercises 2.1·2.2

2.1 The hormone responsible for preparing the uterus for implantation of a fertilised ovum is: [1]

A. melatonin B. progesterone C. adrenaline D. insulin E. cortisol

2.1 Answer: B. Progesterone builds and maintains the uterine lining. The other options do not satisfy the stated defining conditions.

2.2 Compared with neural signalling, hormonal signalling is: [1]

A. faster and more focal B. slower and body-wide C. shorter in duration D. independent of receptors E. limited to the brain

2.2 Answer: B. Hormones travel the bloodstream: slow, sustained, and selective only via receptors. Compare the exact process, design or evidence, rather than an associated keyword.

Exercises 2.3-3.1

2.3 Revisit the worked case. State one conclusion its evidence supports and one stronger conclusion it does not support. Explain the difference. [2]

3.1 A hormone reaches many organs but affects only some cells. Explain why broad circulation and selective effects are compatible. Give the interpretation, supporting reasoning, a relevant alternative or limitation, and an appropriate check. [4]

Exercises 2.3-3.1

2.3 Revisit the worked case. State one conclusion its evidence supports and one stronger conclusion it does not support. Explain the difference. [2]

2.3 Use the worked case evidence to support a bounded claim and explain why a causal, universal or stronger claim needs additional evidence. The claim must fit the specific design and observed process.

3.1 A hormone reaches many organs but affects only some cells. Explain why broad circulation and selective effects are compatible. Give the interpretation, supporting reasoning, a relevant alternative or limitation, and an appropriate check. [4]

3.1 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. Award B1 each (authored) for the interpretation, its reasoning, a relevant limitation/alternative and an appropriate check, up to four points. Accept a different justified answer satisfying these demands.