What are Negative and Positive Feedback Mechanisms?

Worksheet

Negative feedback opposes a change to bring a variable back toward its set point (most homeostatic regulation), while positive feedback reinforces a change, pushing the variable further away until a specific event ends the loop.

Questions

1. Negative feedback works by

A) Amplifying a change
B) Reversing a change to restore balance
C) Ignoring a change
D) Randomly altering the set point

2. Which is an example of positive feedback?

A) Sweating to cool down
B) Shivering to warm up
C) Contractions intensifying during childbirth
D) Insulin lowering blood glucose

3. Why is negative feedback more common than positive feedback in the body?

A) It's simpler chemically
B) It maintains stability, which most systems need
C) Positive feedback doesn't exist in humans
D) It requires no receptors

4. What typically ends a positive feedback loop?

A) The set point resetting itself
B) A specific triggering event completing (e.g. birth, clot formation)
C) Negative feedback taking over immediately
D) Nothing - it never ends

5. Room temperature drops below the thermostat setting, so the heater turns on and warms the room back up. Is this negative or positive feedback? Explain.

6. During blood clotting, platelets release chemicals that attract more platelets to the wound, which release more chemicals, rapidly forming a clot. Classify this feedback and explain why the loop eventually stops.

7. Blood pressure rises after a stressful event. Baroreceptors detect the rise and signal the brain, which reduces heart rate and dilates blood vessels to lower it back to normal. Classify and explain.

8. Define: What does negative feedback do?

9. Define: What does positive feedback do?

10. Define: Which type is more common in the body?

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Answer Key

1. B) Reversing a change to restore balance - Negative feedback opposes the initial change to bring the variable back to its set point.

2. C) Contractions intensifying during childbirth - Labor contractions are amplified by more oxytocin release - a self-reinforcing loop.

3. B) It maintains stability, which most systems need - Most physiological variables need to stay stable, which negative feedback provides.

4. B) A specific triggering event completing (e.g. birth, clot formation) - Positive feedback loops are broken by an external event that removes the trigger, not by self-correction.

5. The change (temperature drop) triggers a response (heater on) that opposes the change. The room warms back toward the set point, and the heater shuts off. This reverses the original change - it's negative feedback.

6. Each step amplifies the next (more platelets more chemicals even more platelets) - this is positive feedback. The loop is self-reinforcing, unlike negative feedback which would oppose the initial signal. It stops once the clot physically seals the wound and no more platelets are exposed to the trigger - a structural, not corrective, endpoint.

7. The response (lower heart rate, vessel dilation) opposes the initial rise in blood pressure. Blood pressure moves back toward its normal set point. Because the change is reversed rather than amplified, this is negative feedback.

8. Reverses a change to restore the system to its set point.

9. Amplifies a change, pushing the system further from its starting state.

10. Negative feedback - it's the basis of most homeostatic regulation.

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