

Genetics Review Cards Part 5

Feedback

- a. Negative feedback mechanisms maintain dynamic homeostasis for a particular condition (variable) by regulating physiological processes, returning the changing condition back to its target set point.
- b. Positive feedback mechanisms amplify responses and processes in biological organisms. The condition initiating the response is moved farther away from the initial set-point. Amplification occurs when the stimulus is further activated which, in turn, initiates an additional response that produces system change.

EditQ.1?

In a positive feedback system, where hormone A alters the amount of protein X

A an increase in X will always produce a decrease in A

C a decrease in X always causes a decrease in A

B an increase in A will always produce an increase in X

D a decrease in A always produces an increase in X

Cell-to-cell communication

- a. Cells receive or send inhibitory or stimulatory signals from other cells, organisms or the environment.
- b. In single-celled organisms, it is response to its environment.
- c. In multicellular organisms, signal transduction pathways coordinate the activities within individual cells.
- d. Cells communicate by cell-to-cell contact. Ex. plasmodesmata between plant cells that allow material to be transported from cell to cell.

- e. Cells communicate over short distances by using local regulators that target cells in the vicinity of the emitting cell.
- f. Signals released by one cell type can travel long distances to target cells of another cell type.
- g. A receptor protein recognizes signal molecules, causing the receptor protein's shape to change, which initiates transduction of the signal.

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h. Signal transduction is the process by which a signal is converted to a cellular response. Signaling cascades relay signals from receptors to cell targets, often amplifying the incoming signals, with the result of appropriate responses by the cell.

i. Second messengers inside of cells are often essential to the function of the cascade.

j. Many signal transduction pathways include: Protein modifications or phosphorylation cascades in which a series of protein kinases add a phosphate group to the next protein in the cascade sequence.