AP Bio Unit 4: Cell Communication and Cell Cycle Cheat Sheet

by PrincessB3ll3 via cheatography.com/122525/cs/22785/

Signal Transduction

Function: results in changes in gene expression and cell function, which may alter phenotype or result in programmed cell death (apoptosis)

1. Recognition of a chemical messenger (ligand) by a receptor protein in a target cell

-Ligand-binding domain of receptor recognizes ligand (peptide, small chemical, or protein) in a specific one-to-one relationship.

-Ex: G protein-coupled receptors in eukaryotes

2. Signaling cascades relay signals from receptors to cell targets

-Often amplify incoming signals

-Results in cell growth, secretion of molecules, or gene expression

3. After ligand binds intracellular domain of a receptor protein changes shape, initiating signal transduction

-Second messengers: Molecules that relay and amplify the intracellular signal (ex: cyclic AMP)

-Binding of ligand to ligand-gated channels can cause channel to open or close

Changes in Signal Transduction

Changes that alter cellular response:

-Mutations in any domain of receptor protein or component of signaling pathway may affect succeeding components

-Chemicals that interfere with any component of the signaling pathway may activate or inhibit the pathway

Feedback

Negative:

-Maintain homeostasis for a particular condition by regulating physiological processes

-If system disrupted, negative feedback mechanisms return system to target set point

-Operate on molecular and cellular level

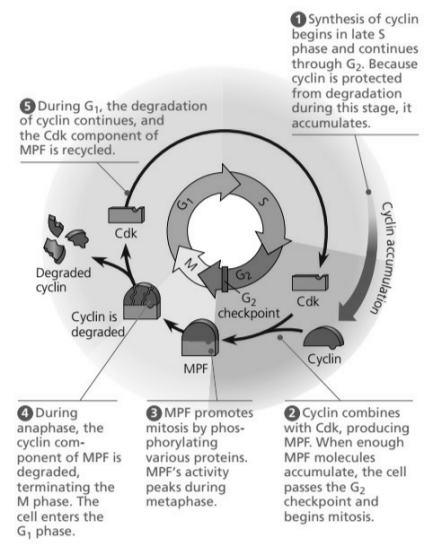
Positive:

-Amplify responses and processes in biological organisms

-If system disrupted, positive feedback mechanism moves farther from set point

-Amplification: stimulus is further activated, initiates an additional response that produces system change

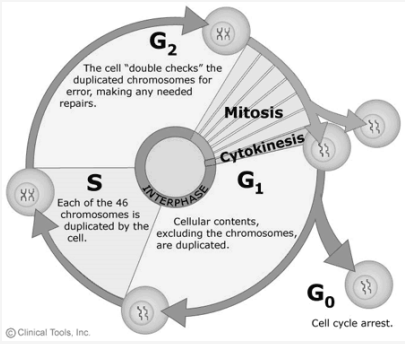
Cyclin and CDK Regulation



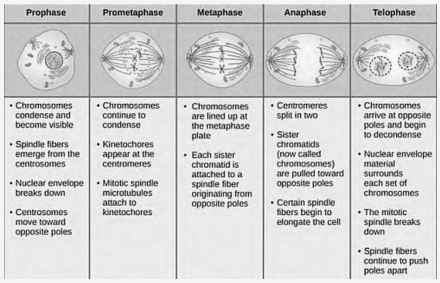
Cell Signaling

Direct Contact	Cell-Cell or through gap junctions
Synaptic	Neuron signaling (neurotransmitters)
Paracine	Cell releases chemicals for cells within vicinity to receive (growth factors)
Endocrine	Long distance and large amounts of cells (hormones)

Cell Cycle



Mitosis



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Not published yet.
Last updated 14th May, 2020.