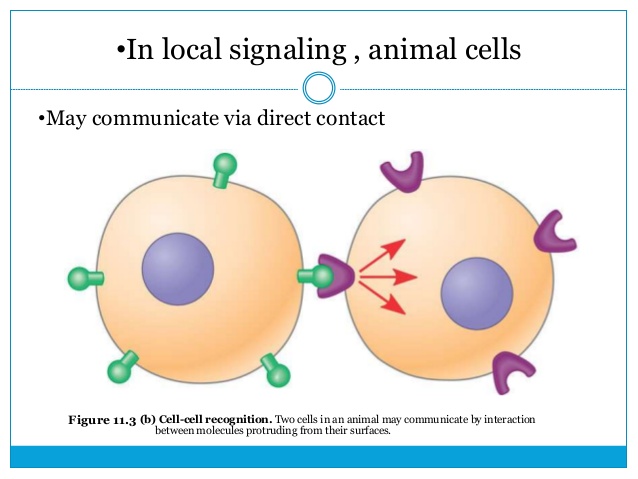
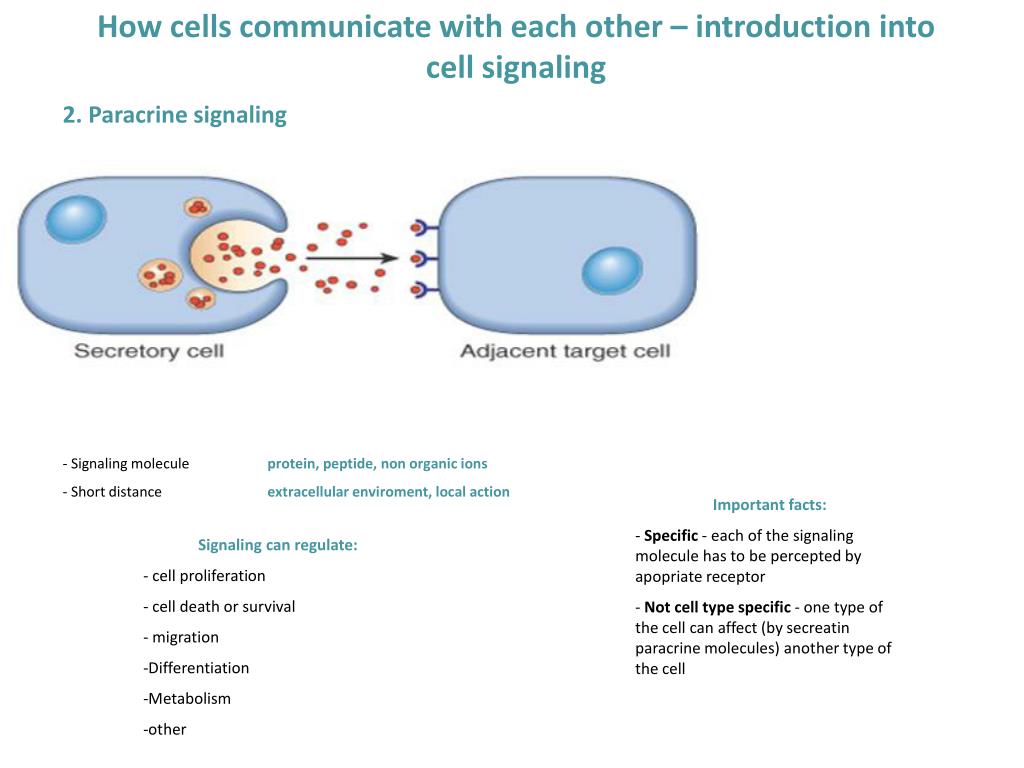
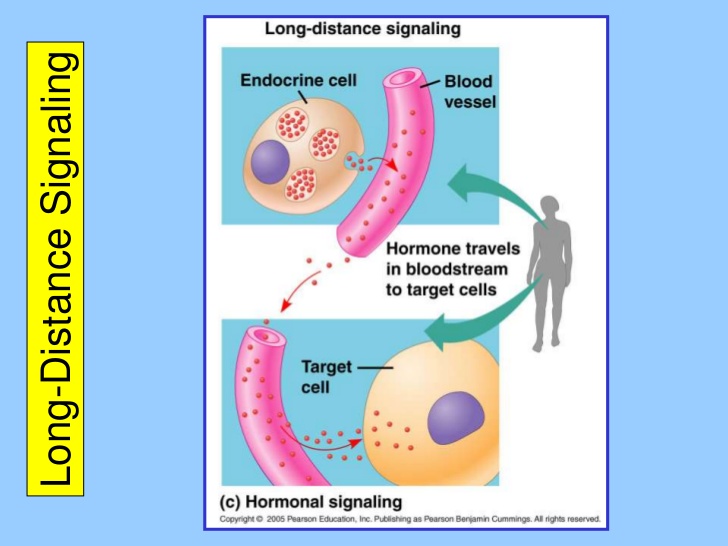
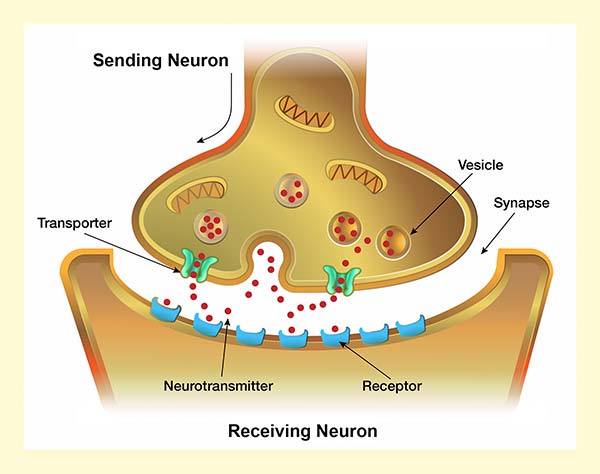
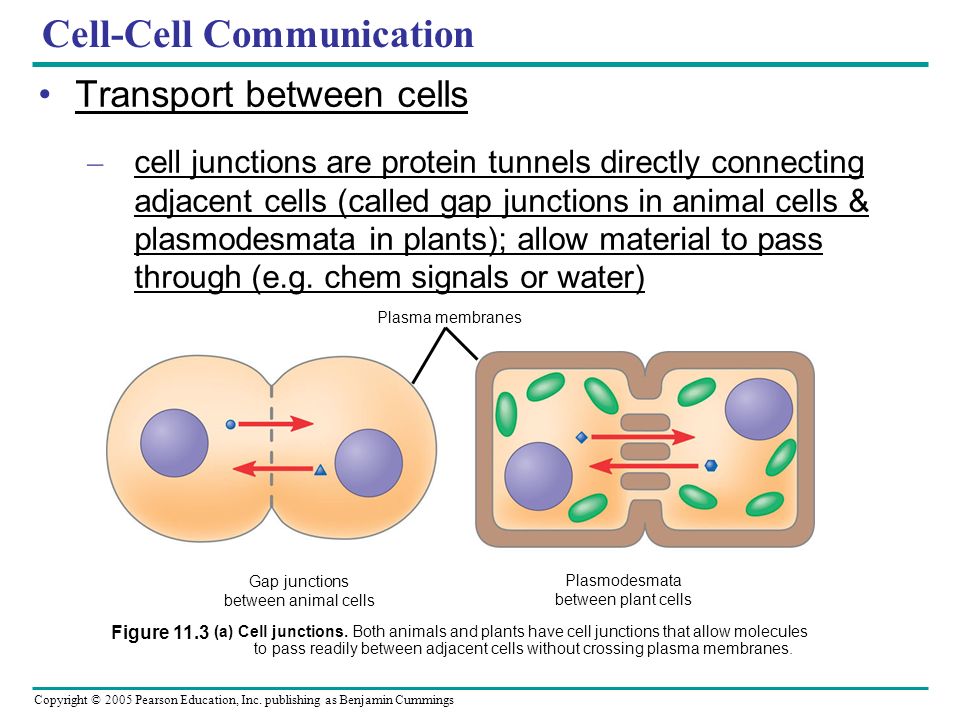
Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Unit 4: Cell communication

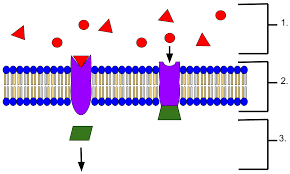
1. Describe the ways Cells can communicate with one another
2. Identify the type of communication in each diagram as direct contact, short distance, or long distance AND JUSTIFY your answer for each



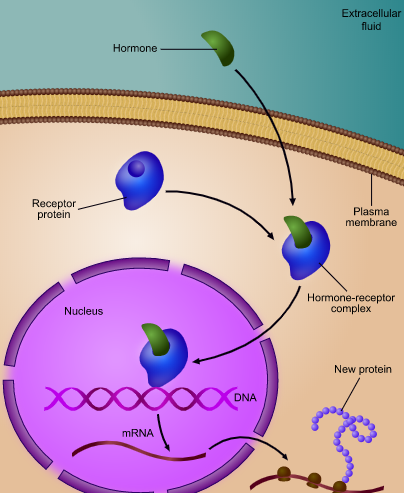




1. Explain Why cell communication is important



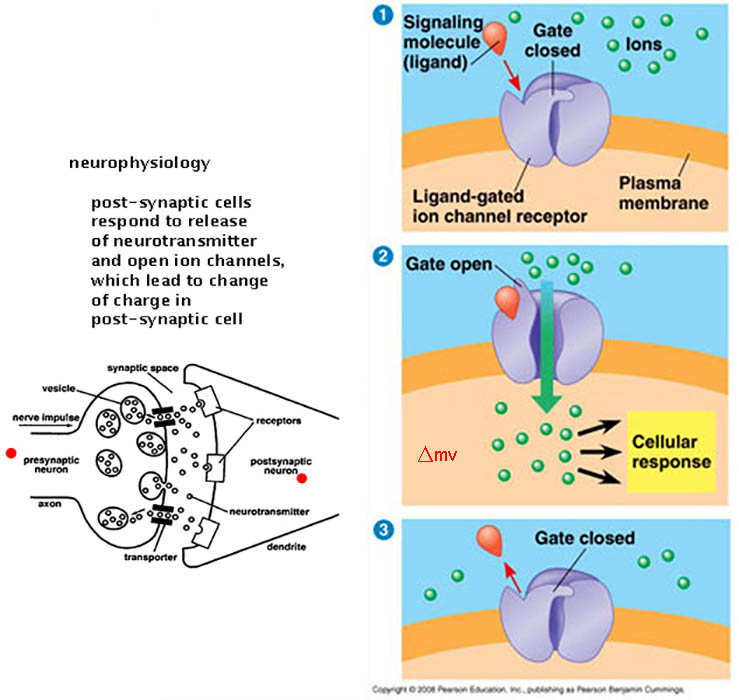
1. Explain hoe cells communication with one another
2. Identify the ligand in the following diagram
3. Explain the purpose of the ligand
4. Describe how a ligand can activate a cell
5. Describe how different types of ligands interact with a cell for communication
6. Describe the structural properties of a steroid hormone
7. IDENTIFY the location of the receptor that a steroid hormone will bind with and EXPLAIN why it must bind to the receptor in that location
8. Describe the structural properties of a protein ligand
9. IDENTIFY the location of the receptor that a protein hormone will bind with and EXPLAIN why it must bind to the receptor in that location



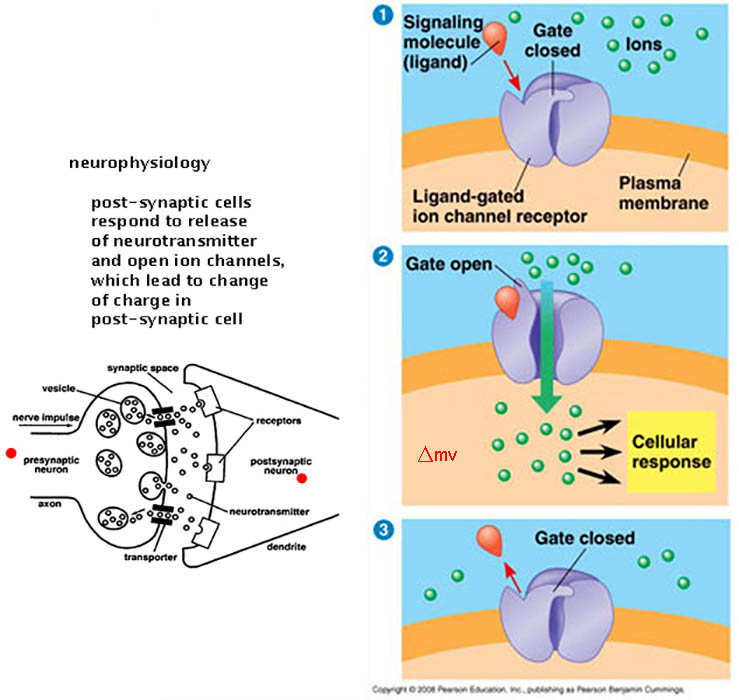
1. IDENTIFY the type of ligand that is in the diagram and EXPLAIN why you chose that type of ligand

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Unit 4: Ligands and Signal Transduction Review

1. Ligands can allow the movement of Ions

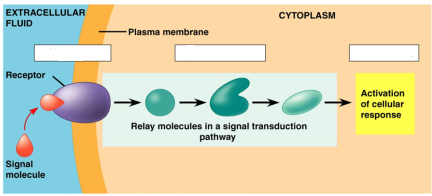


1. Describe how ligands allow for the movement of ions through a ligand gated ion channel



1. Explain the importance of ligands on gated ion channels
2. Ligands can activate the cell which lead to a signal transduction. Signal transduction pathways link signal reception with cellular responses.
3. state the difference between a target cell and non- target cell and explain why you would not want every cell in the body to contain every type of receptor
4. Define signal transduction pathway and explain the importance
5. Identify and explain the three stages in the signal transduction pathway

Stages 1. 2. 3.

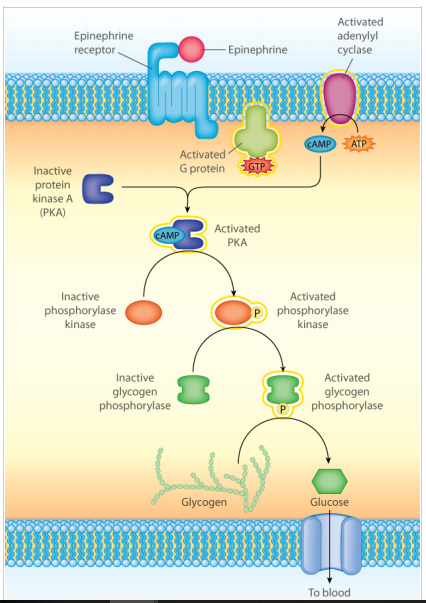
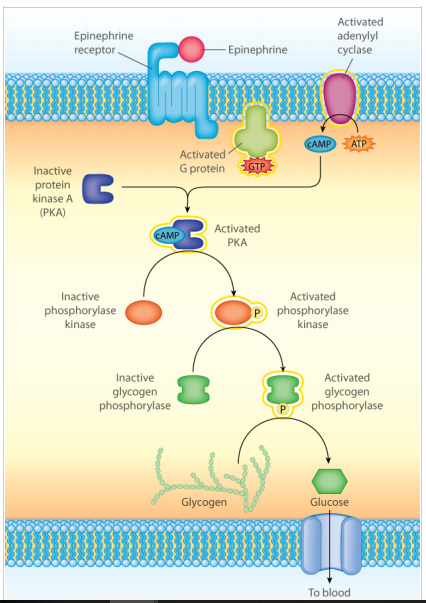
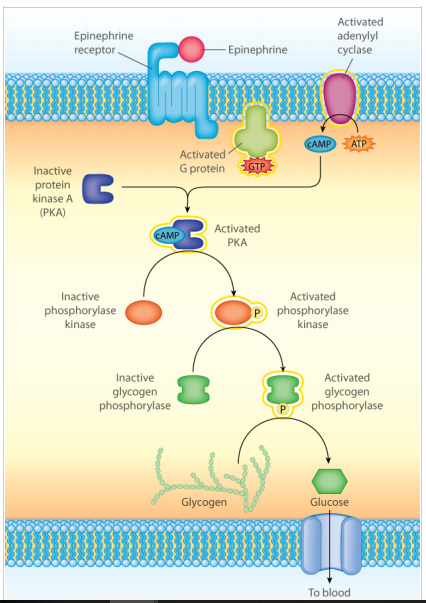
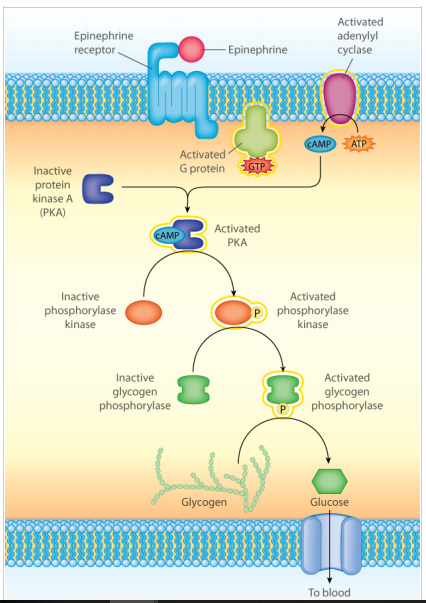


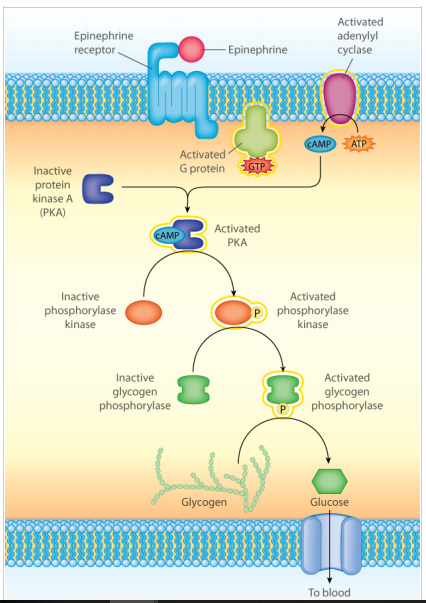
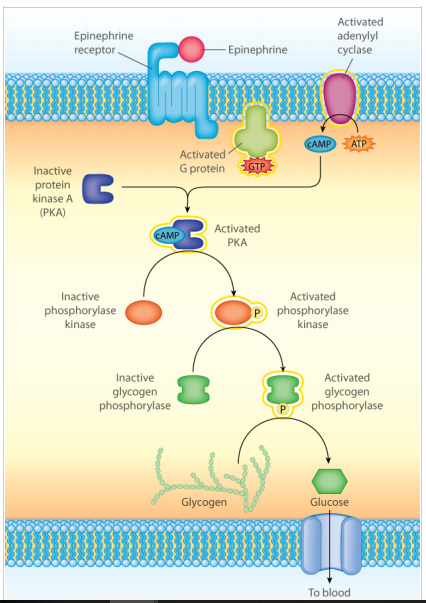
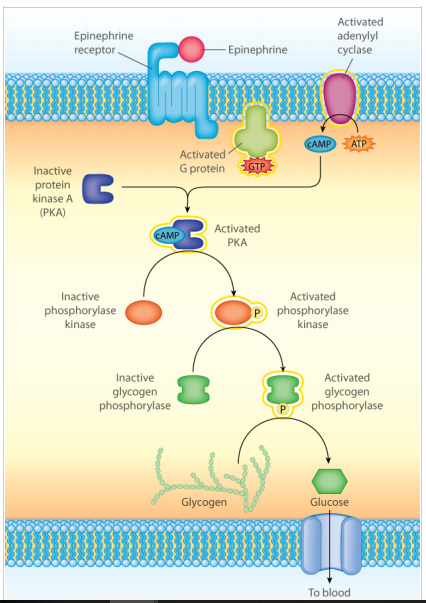
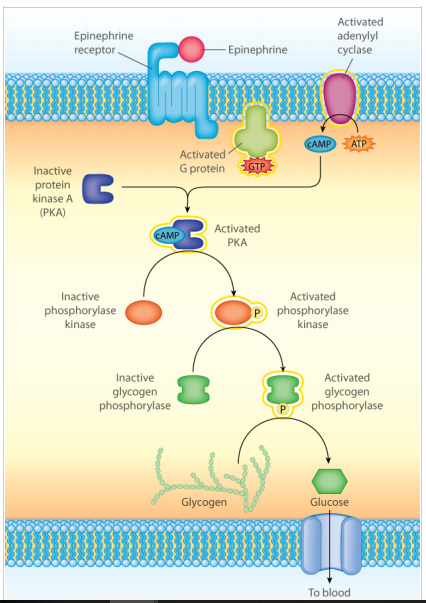
Explain stages:

3. Cells communicate by generating, transmitting, receiving, and responding to chemical signals. Describe the role of components of a signal transduction pathway in producing a cellular response. A series of steps are needed to complete the signal transduction pathway and elicit a response. Explain what is occurring at each step by answering each question

Step 1: Ligand binding to the receptor protein

1. Circle and Identify the Ligand in the signal transduction pathway diagram below
2. DESCRIBE what happens to the receptor protein when the ligand binds and EXPLAIN its importance





Step 2: Activation of the enzyme adenylyl Cyclase

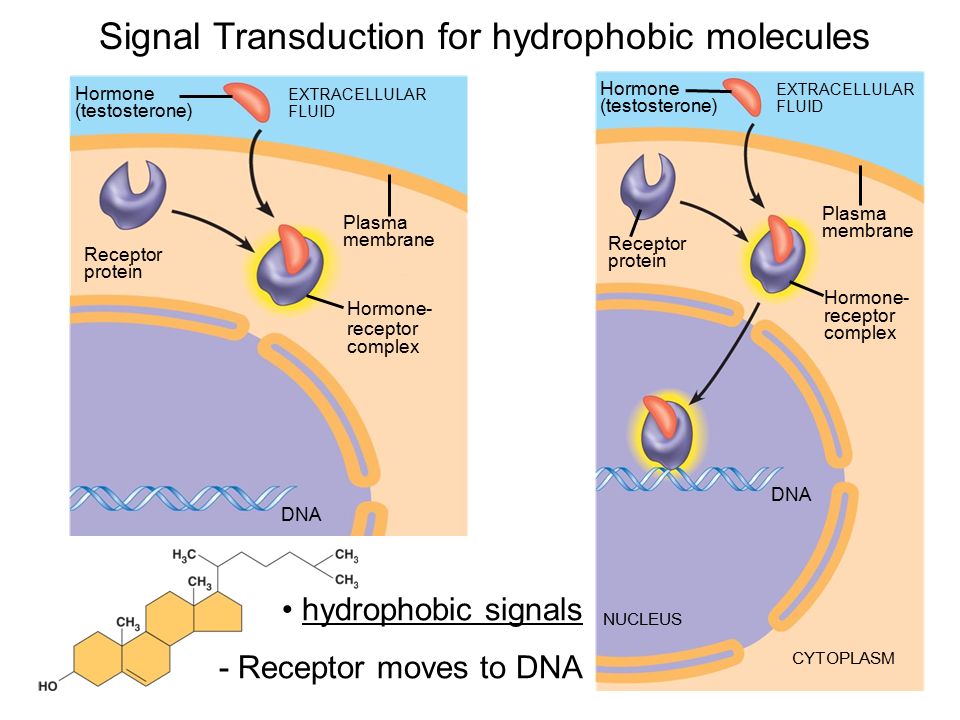
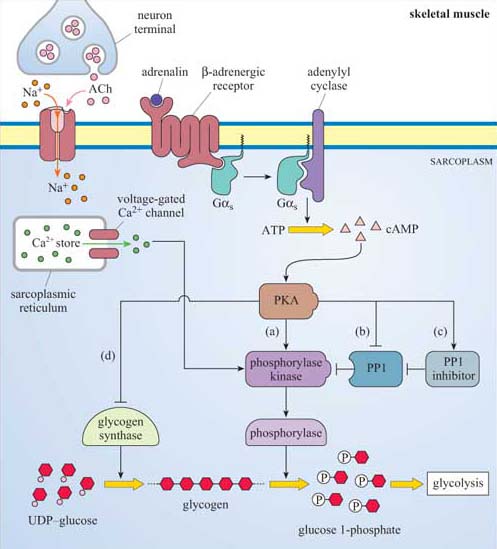
1. Describe the process that activates adenylyl cyclase
2. Explain what adenylyl cyclase is responsible for once the enzyme is activated

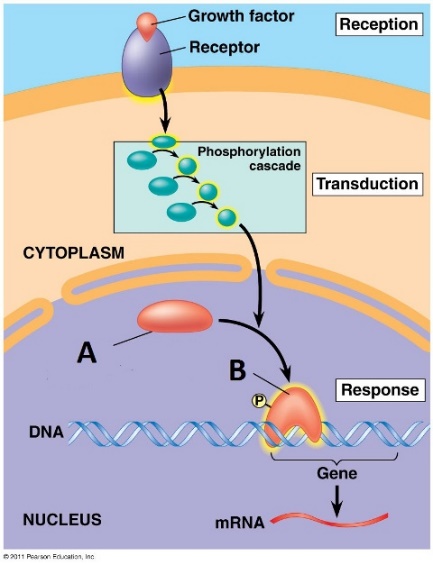
Step 3: Phosphorylation Cascade

1. Circle and label the secondary messenger in the diagram on the previous page and DESCRIBE the overall role of cAMP on the signal transduction pathway
2. Explain how cAMP activates a phosphorylation cascade
3. Describe what happens during a phosphorylation cascade
4. Explain the importance of a phosphorylation cascade

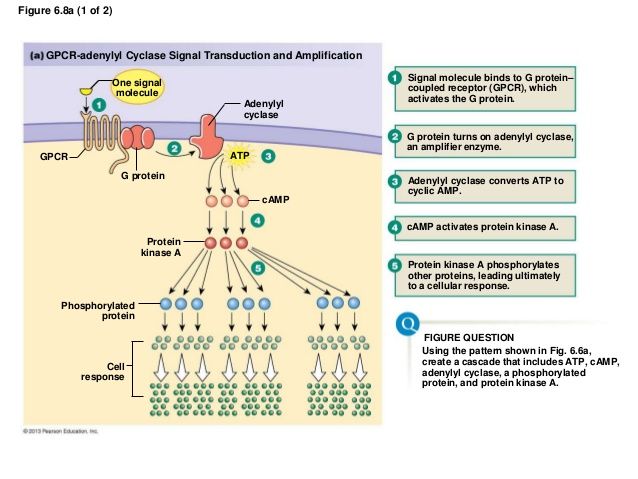
Step 4: Response

1. Identify the types of responses that can occur as a result of signal transduction
2. Identify the type of response in the diagrams below





1. The signal is often amplified in the cell.
2. DESCRIBE what amplification is AND EXPLAIN its importance



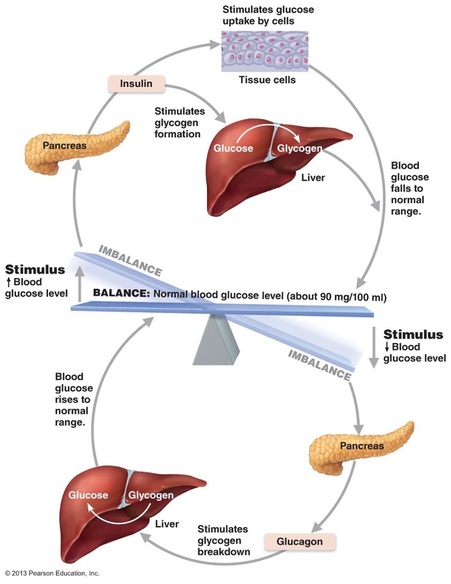
1. Circle the amplification area

In the diagram to the right

1. Chemicals that interfere with any component of the signaling pathway may activate or inhibit the pathway.
2. Explain how chemicals can interfere with the signaling pathway
3. PREDICT the type of medication (what physical properties would be present) that could inhibit cyclic AMP and turn off a signaling pathway AND JUSTIFY your prediction
4. Changes in signal transduction pathways can alter cellular response
5. Describe a mutation that could occur to a receptor protein
6. Explain what would occur if there was a mutation in the receptor protein

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Unit 4: Feedback and Cell Cycle

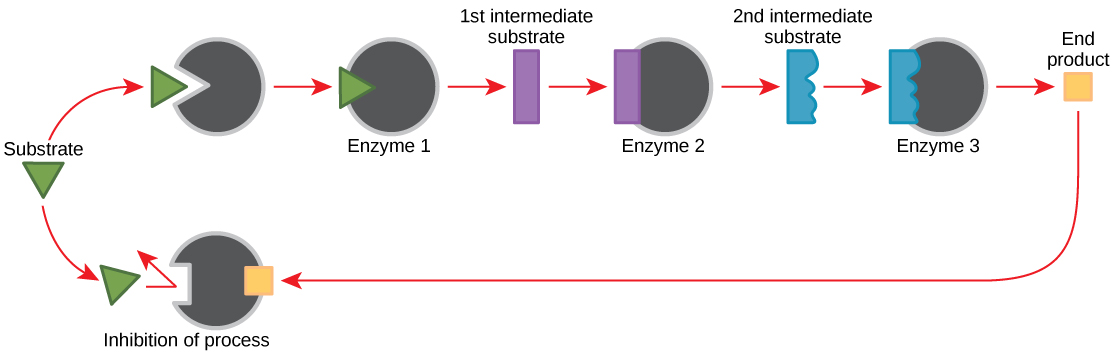
1. Timing and coordination of biological mechanisms involved in growth, reproduction, and homeostasis depend on organisms responding to environmental cues.
2. Each physiological condition in the body has a set point. Explain what a set point is and give examples conditions in the body that have a set point
3. Identify the types of feedback mechanisms that occur in organisms and Explain why organisms use feedback mechanisms
4. Negative feedback works to maintain homeostasis in the organism/cell
5. Describe what is occurring in the organism/cell to require a negative feedback mechanism
6. Explain how the negative feedback process works to maintain homeostasis in the organism when there is a change to the set point
7. For the following negative feedback example below: Identify ONE change that is occurring to the set point and EXPLAIN how negative feedback works to return the system back to its target set point



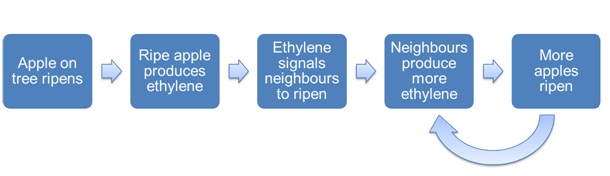
1. For the negative feedback example answer the following:

* Describe a mutation that could occur
* Predict the impact the mutation would have on the negative feedback loop
* Justify your prediction

1. Feedback inhibition can regulate enzyme catalyzed pathways
2. Describe the feedback that is occurring in the diagram below and EXPLAIN its importance



1. Identify the structure that is acting as the allosteric regulator in the above feedback
2. Explain how positive feedback affects homeostasis.
3. Explain what a positive feedback mechanisms do to the responses and process in organisms
4. Describe a positive feedback response as a result of a change in the set point.
5. Explain the positive feedback that is occurring in the diagram below and state the end result of this positive feedback



1. In eukaryotes, cells divide and transmit genetic information via two highly regulated processes.
2. Identify the phases of the cell cycle and Give a brief description of each phase
3. Describe what is occurring during the G1, S and G2 phases of interphase

* G1
* S
* G2

1. Draw a bar graph to show the amount of DNA that would be found in the different stages of the cell cycle if the initial amount of DNA was 4

Amount of DNA per phase Number of Chromosomes per phase

8

7

6

5

4

3

2

1

0

Initial cell

Interphase

Prophase

Metaphase

Anaphase

Telophase

Daughter cells

8

7

6

5

4

3

2

1

0

Initial cell

Interphase

Prophase

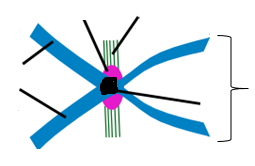
Metaphase

Anaphase

Telophase

Daughter cells

1. Draw a bar graph to show the number of chromosomes that would be found in the different stages of the cell cycle if the initial number of chromosomes was 4
2. Identify the stage a cell enters when it is no longer dividing
3. Explain how mitosis results in the transmission of chromosomes from one generation to the next
4. Identify the various roles of Mitosis in the body
5. Identify the following structures in the diagram below: sister chromatid, centromere, spindle fibers, kinetochore, chromosome



1. Describe what is occurring in each of the stages of mitosis

* Prophase
* Metaphase
* Anaphase
* Telophase

1. Explain the importance of cytokinesis
2. For each picture below, Identify the stage the cell is in( they are not in order): interphase, prophase, metaphase, anaphase, telophase/cytokinesis

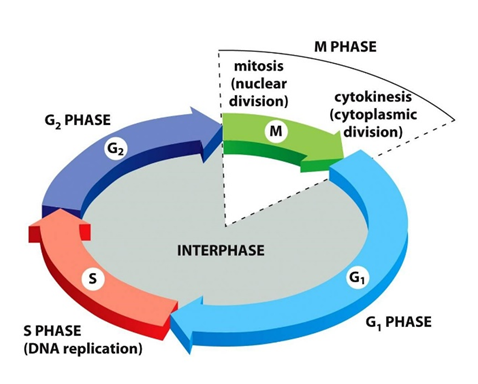




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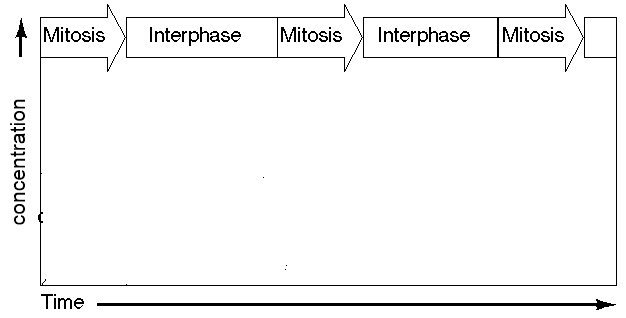
1. For a cell that has undergone mitosis, Describe how newly formed daughter cells compare to the original cell

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Unit 4: cell Regulation

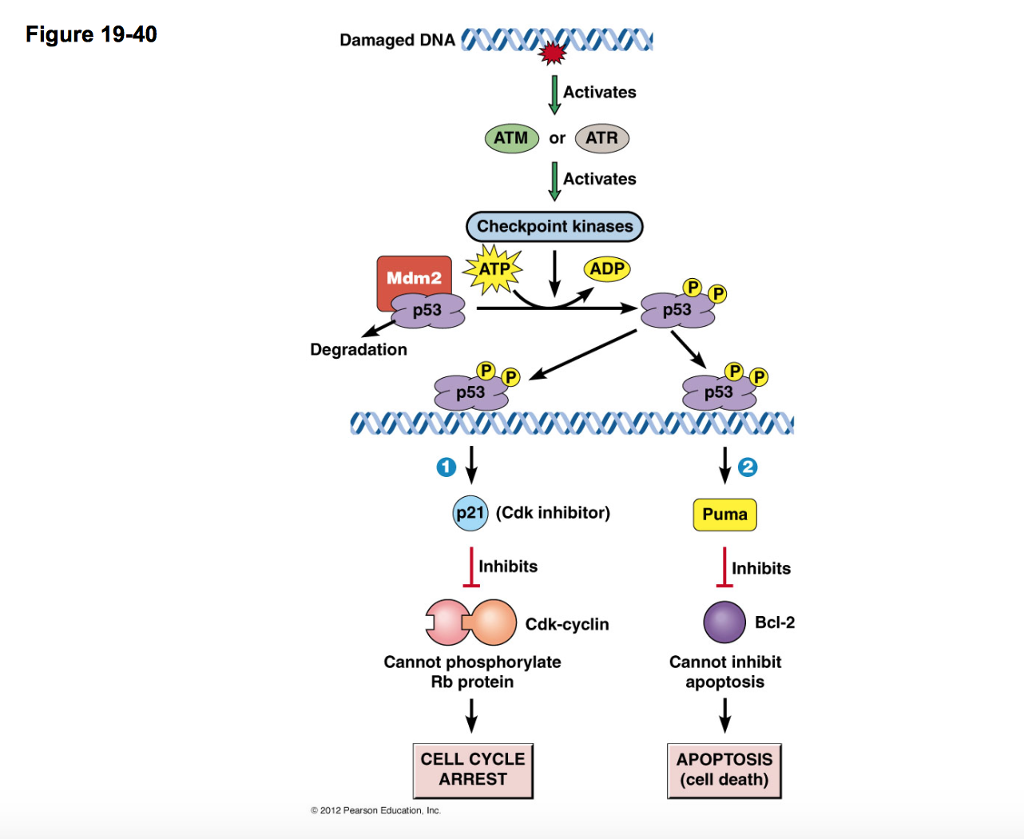
1. Describe the role of checkpoints in regulating the cell cycle. A number of internal controls or checkpoints regulate progression through the cycle.
2. Label the 3 check points that exist in the cell cycle and EXPLAIN the overall importance of checkpoints in the cell cycle
3. Describe the Role of cyclin in cell regulation
4. Describe the role CdK ( cyclin dependent kinase) in the cell cycle
5. Identify the components of MPF AND DESCRIBE the role of MPF (maturation promoting factor)
6. Explain the importance of each checkpoint in the cell cycle

* G1-
* G2 –
* M –

1. Interactions between cyclins and cyclin-dependent kinases control the cell cycle.
2. Describe what happens to the concentration of Cyclin during the cell cycle and Explain why the change in concentration happens
3. Describe the impact the change in Cyclin has on the concentration of MPF
4. Describe what happens to the concentration of MPF as the cell progresses through the cell cycle AND EXPLAIN why the concentration of MPF is changes
5. Explain how the concentration of MPF is used at each checkpoint to determine if the cell will continue past the check point or not advance
6. Graph the concentration of cyclin, and MPF during the cell cycle (interphase and mitosis) and explain what is happening to the concentrations of each



1. Explain why the concentration decreases as the cell progresses through mitosis
2. Explain what happens to the cell if the cell does into pas the G1 checkpoint
3. Disruptions to the cell cycle may result in cancer and/or programmed cell death (apoptosis).



1. Describe the role of the p53 protein on the cell cycle
2. Explain the importance of the p53 protein
3. Describe the outcome to the cell when apoptosis occurs AND EXPLAIN why this process is necessary
4. Predict what would happen to the cell cycle if there was a mutation in the p53 gene AND JUSTIFY
5. Describe what happens to the length of the cell cycle in a cancerous cell AND EXPLAIN why this change happens.
6. Predict what would happen to the cell going through the cell cycle if a medication inhibits the formation of cyclin AND JUSTIFY your prediction