Name: _____ Hour: _____ Course: BIOLOGY

# Unit 3: The Cell Cycle & Mitosis

## "The Eukaryotic Cell Cycle & Cancer"

# ONLINE STUDY

**Directions:**

- Go to Canvas and Biology.
- Click on Modules.
- Click on “The Eukaryotic Cell Cycle & Cancer”.
- Click the link provided.
- Click through and find the answers to the following questions.


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→ ***CLICK ON THE BACKGROUND TAB ON THE RIGHT SIDE →***

**(1) Compare and Contrast reasons CELL DIVISION is important in UNICELLULAR and MULTICELLULAR organisms:**

| UNICELLULAR<br>Cell Division Only | Both<br>(Similarities) | MULTICELLULAR<br>Cell Division Only |
|---|---|---|
| | | |

**(2) Provide an example of why cell division remains important to an adult organism even after it is fully developed:**

**(3) What is the role of GROWTH FACTORS in cell division?**

**(4) Cells divide, differentiate, or die. What does "differentiation" mean?**

**(5) What is apoptosis? Explain its purpose.**

**(6) Organisms maintain the right number of cells by regulating the cell cycle. What are "cell cycle regulators"?**

**(7) What is 1 harmless result of TOO LITTLE cell division?**

**(8) What is 1 harmless result of TOO MUCH cell division?**


***→ CLICK ON THE SECTION OF THE CIRCLE LABELED <u>"CELL CYCLE PHASES"</u> (in the center purple circle, on the right) and use the <u>"OVERVIEW" INFORMATION</u> IN THE WINDOW TO THE LEFT →***

**(9) List in order, the 4 events we collectively call the "CELL CYCLE"**

Event 1 = _____

Event 2 = _____

Event 3 = _____

Event 4 = _____

**(10) What is the purpose of the Checkpoint in the Cell Cycle?**

**(11) What is 1 potential outcome when errors occur during the cell cycle?**


***→ CLICK ON "CELL CYCLE REGULATORS AND CANCER" (in the center purple circle on the right) and then "REGULATORS OVERVIEW" IN THE WINDOW TO THE LEFT →***

**(12) What type of protein, that regulates the cell cycle, is encoded by proto-oncogenes?**

**(13) What type of protein that regulates the cell cycle, is encoded by tumor suppressor genes?**

**(14) The most important cell cycle regulators are the _____.**

**(15) What is a KINASE, and what does it do?**

**(16) When are CDKs present inside the cell during the cell cycle?**

**(17) When are CYCLINS present inside the cell during the cell cycle?**

**(18) CDKs form molecular complexes with cyclins. What do activated CDK-CYCLIN COMPLEXES do?**


***→ USE THE <u>CELL CYCLE DIAGRAM</u> ON THE RIGHT (and both links in the center purple circle) →***

**(19) What happens during each of the following?**

| PHASE | What happens during the Phase? | Is there a Checkpoint? What is Checked? |
|---|---|---|
| G1 | | |
| S | | |
| G2 | | |
| M | | |


→ ***GO TO <u>"CELL CYCLE PHASES"</u> and CLICK ON <u>"INTERPHASE"</u>*** →

**(20) What happens during Interphase and what phases does it include?**

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→ ***GO TO <u>"CELL CYCLE PHASES"</u> and CLICK ON <u>"G0"</u>*** →

**(21) What is the G0 Phase?**

**(22) What 3 factors determine if a cell enters G0?**


***→ CLICK ON <u>"CELL CYCLE REGULATORS AND CANCER"</u> (in the center purple circle on the right) and then <u>"OVERVIEW"</u> IN THE WINDOW TO THE LEFT →***

**(23) Cancer is an improperly regulated cell cycle. Name 2 reasons cells can form Tumors:**

**Reason 1 = _____**

**Reason 2 = _____**

**(24) What causes uncontrolled cell division at the genetic level?**

(25) ***Watch the VIDEO CLIP:*** **At the cellular level in this example, explain what occurs if the APC gene is mutated…**

**(26) Normally, genes called "proto-oncogenes" stimulate the cell cycle. What do MUTATED "proto-oncogenes" cause?**

**(27) Normally, tumor suppressor genes inhibit the cell cycle. What do mutated tumor suppressor genes cause?**

**(28)** ***WATCH THE VIDEO CLIP:***

**Using the gas pedal analogy, explain the impact on the cell cycle of a proto-oncogene vs an oncogene…**

**(29) Using the brake pedal analogy, explain the impact on the cell cycle of 1 mutated tumor suppressor gene allele, versus 2 mutated tumor suppressor alleles…**