

Lesson 2 Problem Set: "Cell Cycle and Cancer"

Multiple Choice:

1. In which stage of the cell cycle is each chromosome composed of two chromatids in preparation for mitosis?

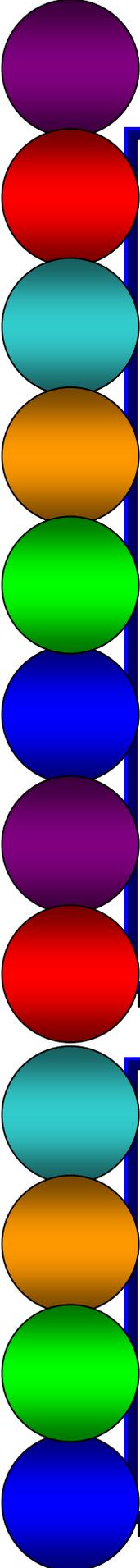
- A. G1
- B. S
- C. G2
- D. M

2. CDKs increase their enzymatic activity by complexing with:

- A. Rb
- B. Cyclins
- C. E2F transcription factors
- D. All of the above

3. Vinblastine is a drug used to treat cancer, since it is known to stop the cell cycle. The drug interferes with the assembly of microtubules, and therefore its effectiveness must be related to:

- A. disruption of mitotic spindle formation
- B. inhibition of regulatory protein phosphorylation.
- C. suppression of cyclin production.
- D. inhibition of DNA synthesis.

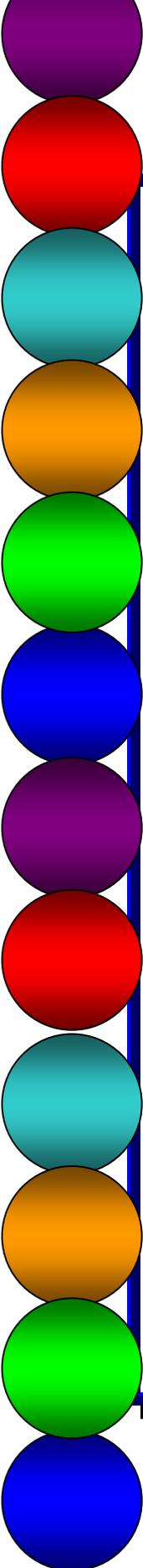


Short Answer:

1. Describe what a checkpoint is and why it is important in preventing cancer cells from arising.
2. What is *G0*?
3. Describe the function of a kinase. What specific kinases regulate the cell cycle?
4. What are histones? How do they appear under an electron microscope?
5. What is the difference between chromosomes and chromatids?
6. If a researcher treated a cancer cell that prevented it from synthesizing DNA. What stage of the cell cycle would the cell be trapped in? Explain.

True/False: Determine whether the following statements are true or false. If you choose false, please explain why part or all of the statement is incorrect.

1. The stage in which cells are preparing for DNA replication is in S phase.
2. The first stage in which chromosomes become visible in mitosis is called anaphase.
3. Cancer cells are different from normal cells, in that, they have escaped cell cycle control.



4. Cells in G0 will eventually die.

5. Interphase is a phase in mitosis:

Below are pictures taken of cells from an onion root tip. Please identify one cell that is in:

- A: Prophase
- B: Metaphase
- C: Anaphase
- D: Telophase

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.