Cancer Mitosis

Topic:
Gene Expression (Ch. 11-2) Read pp. 225-228 in *Modern Biology*.

Objectives: Students will be able to-
- Understand how cancerous cells differ from normal cells

Activities:

- Use a computer spreadsheet to graph cancer cell growth –vs- normal cell growth

- Define the 11 boldfaced terms in pages 225-228 in *Modern Biology*. A list of these words can be found on page 229, in the Vocabulary section.

- Answer 15 post-lab questions (on reverse side)

Using Excel, create the following:
A single BAR (or column) graph showing both the cancerous and normal mitotic phases, side-by-side, for comparison purposes.
*Be sure graph has a descriptive title, and everything is labeled (axes, units, etc.)

You will need to compose three pages of information for your report, in addition to this lab ditto.
Page 1- cover page (standard format)
Page 2- this worksheet (directions)
Page 3- Graph
Page 4,5- 15 post-lab questions answered and 11 **boldfaced** vocabulary terms **defined** from pages 225-228.

Laboratory Data: time spent for normal and cancerous chicken stomach lining cells to undergo various stages of mitosis and interphase.

PHASE	NORMAL CELLS	CANCEROUS CELLS
Interphase	540 min	75 min
Prophase	60 min	75 min
Metaphase	10 min	15 min
Anaphase	3 min	2 min
Telophase	12 min	1 min

Post-lab Questions: To be answered in *complete* sentences.

1. Discuss your graph! What obvious features do you notice? Give me your overall analysis of the data.

2. How long did normal cells spend in mitosis (PMAT)? How about about cancerous cells (how did they compare)?

3. How long did normal cells and cancer cells spend in interphase? What does this data mean to the overall number of new cells created in a given period of time?

4. What is the uncontrolled dividing of cells called? Is this an example of abnormal mitosis?

5. What genes play a role in regulating cell division?

6. What will happen when normal cells are allowed to grow in a glass dish containing nutrients? Compare the behavior of cancer cells under similar conditions.

7. What might mutations in (a) tumor-suppressor genes or (b) proto-oncogenes cause?

8. What is the relationship between environmental factors and cancer? Give a few examples of environmental factors that increase risk.

9. What is a tumor? What is the difference between a benign and a malignant tumor?

10. Cancer is the second leading cause of death in the United States. What four types of cancer are most common in the US?

11. Can cancer be prevented? How?

12. What is the difference between a carcinoma, a sarcoma, and a lymphoma?

13. What is a “carcinogen”? List three examples.

14. Are any cancers associated with viruses? If so, name two such viruses and which cancers they cause.

15. When you go to the dentist and dental x-rays are taken, the dentist normally covers the rest of your body in a lead apron. Why? Why might x-rays (radiation) be more dangerous to an ovary or a testis than to a muscle cell?