Module 1: Study Guide Questions

1. Provide a very general description of cancer and cancer cells.

2. How are cancers typically classified?

3. Describe some of the evidence supporting the idea that cancers arise from a single cell that has gone through a progression of changes.

4. What evidence supports the idea that most cancers (80-90%) appear to be avoidable? Include a description of the factors that determine the frequency of the types of cancer people contract and how these factors are classified.

5. What is the current state of cancer treatment and are we close to a cure? What does the relatively new anticancer drug Gleevic represent for how cancer treatment is changing with the advent of a more detailed understanding of the changes occurring during cancer cell development?

6. Describe the general process of structure-activity relationship studies in drug design. Who developed this approach and why?

7. What are two new approaches to developing drugs that reduced the cost significantly?

8. What are key aspects of anti-cancer drugs and their targets?

9. Describe the main steps and approaches in the analysis of potential anti-cancer drugs.

10. Iressa is a drug with a high affinity for the EGF-R kinase active site. How do the results of treatment of cancer patients both provide hope and concern for the prospects of curing cancer soon?

11. How would you characterize the prospects for finding a cure for cancer in the near future?

12. What are the four main classifications of the cellular chemical components? What types of macromolecules do these components serve as the building blocks for?

13. What are the primary atoms and types of compounds that make up cells?

14. What is the most abundant molecule in a living cell? What are the key properties of this molecule?

15. What is the primary type of chemical interaction it enters into with other polar molecules? How is the tendency of this molecule to enter into the same type of interaction with others of the same molecule important for the existence of life?

16. What makes carbon outstanding among all of the chemical elements? What are the types of chemical bonds carbon can form and how do they affect molecular structure?

17. How do C, H, O, and N differ with regard to electronegativity? How does this affect the properties of the bonds and functional groups they form?

18. Which of the three diagrams does not represent a functional group that forms an organic acid and base?

19. An almost infinite number of organic molecules are possible, but cells contain only a very few types of small organic molecules, a subset of which are used as building blocks to generate a large number of macromolecules. Why do you suppose that this is the case?