

The Biology of Cancer, 2nd Edition, Question Bank

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Chapter 2 The Nature of Cancer

Level 1: Comprehension of reading, knowledge of terminology

Level 2: Understanding and application of information to compare and contrast or interpretation of data

Level 3: Analysis and application of information to a problem, an experiment, a secondary concept, or previous knowledge

2.1 Which of the following is true of carcinomas? (*Level 2*)

- A. They are responsible for >80% of Western world cancer deaths.
- B. They involve cell types arising from all three embryonic germ layers.
- C. They often involve epithelial cells.
- D. Examples of tissue sites where they are found include the lung and pancreas.
- E. All of the above.

2.2 Tumors that arise from mesenchymal cell types are called (*Level 1*)

- A. Carcinomas
- B. Lymphomas
- C. Sarcomas
- D. Adenocarcinomas
- E. Leukemias

- 2.3** Which of the following types of cellular changes would be considered to be malignant? (*Level 2*)
- A. Dysplasia
 - B. Squamous cell carcinoma
 - C. Papilloma
 - D. Fibroma
 - E. Adenoma
- 2.4** Which of the following schematics MOST likely describes the correct order of cellular changes that occur in the progression of malignancy? (*Level 2*)
- A. Normal → hyperplastic → dysplastic → neoplastic → metastatic
 - B. Normal → dysplastic → hyperplastic → neoplastic → metastatic
 - C. Normal → hyperplastic → dysplastic → metastatic → neoplastic
 - D. Normal → neoplastic → dysplastic → hyperplastic → metastatic
 - E. None of the above
- 2.5** Analysis of a patient's lung tumor reveals that all of the malignant cells in this tumor have a specific chromosomal abnormality involving a fusion event between two sets of chromosomes. This MOST likely suggests that (*Level 3*)
- A. This mutation was inherited.
 - B. The tumor is polyclonal.
 - C. The tumor is monoclonal in origin.
 - D. A large number of normal cells simultaneously underwent this mutation.

E. None of the above.

2.6 In the revised Ames test, Bruce Ames mixed chemicals with homogenized rat liver prior to adding them to bacteria to assess their mutagenicity. What was the purpose of this step of the experiment? (*Level 3*)

A. To determine whether the chemicals killed mammalian cells

B. To determine whether the chemicals induced cancer in mammalian cells

C. To detoxify the chemicals prior to assessing their mutagenicity

D. To metabolically activate the chemicals prior to assessing their mutagenicity

E. None of the above

2.7 Which of the following is NOT a test for mutagenicity? (*Level 2*)

A. Proliferation assay

B. Ames test

C. Test for sister chromatid exchange (SCE)

D. Karyotype analysis

E. Analysis of micronuclei

2.8 A tumor promoter (*Level 3*)

A. Induces mutations in DNA.

B. Can cause cancer on its own.

C. Enhances tumorigenesis through nongenetic mechanisms.

D. Is always a naturally occurring compound.

E. B and C.

2.9 The level of mutagenicity of a particular chemical may depend upon (*Level 2*)

A. Its metabolic conversion within an organism.

B. The cell type with which it comes in contact.

C. Expression levels of genes coding for proteins that are able to inactivate mutagens within the cell.

D. The presence of other tumor-promoting compounds.

E. All of the above.

2.10 Which of the following compounds was identified as being carcinogenic by the Ames test? (*Level 1*)

A. Black pepper

B. Rhubarb

C. Celery

D. Coffee

E. All of the above

2.11 Malignant tumors (*Level 2*)

A. Always contain a single cell type.

B. Have acquired characteristics of invasiveness.

- C. Are surrounded by an intact basement membrane.
- D. Are often described as being *in-situ*.
- E. C and D.

2.12 Which of the following is true of energy metabolism by cancer cells? (*Level 2*)

- A. They usually generate ATP through the Krebs cycle.
- B. They are more efficient at energy metabolism than normal cells and generate 36 molecules of ATP for every glucose molecule metabolized.
- C. They generate energy through glycolysis only when cells are experiencing hypoxia.
- D. They import much higher levels of glucose in comparison with normal cells.
- E. None of the above.

Answers

- 2.1** E
- 2.2** C
- 2.3** B
- 2.4** A
- 2.5** C
- 2.6** D
- 2.7** A
- 2.8** C
- 2.9** E
- 2.10** E
- 2.11** B

2.12 D