The Biology of Cancer, 2nd Edition, Question Bank

Chapter 1 The Biology and Genetics of Cells and Organisms

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

1.1 In a hypothetical cross between two fruit flies, one with red eyes and one with white eyes, all resulting progeny had red eyes. This would suggest that (*Level 2*)

A. The red-eyed trait is recessive to white eyes.

B. The red-eyed trait is dominant to white eyes.

C. The red-eyed and white-eyed genes are co-dominant.

D. The eye color trait is most likely coded for by multiple genes.

E. None of the above.

1.2 Which of the following mutations would be MOST likely to be retained in a species gene pool? (*Level 3*)

A. A mutation resulting in a deleterious change in a cytoskeletal protein structure

B. A mutation in an exon of a gene coding for DNA repair

C. A mutation in an intron of a gene coding for DNA repair

D. Both A and B

E. None of the above

1.3 Many cancer cells exhibit *aneuploidy*, meaning that they (*Level 1*)

A. Proliferate at higher rates than normal cells.

B. Exhibit higher rates of apoptosis than normal cells.

C. Have an abnormal number of chromosomes.

D. Have a normal number of autosomes.

E. Have mutations in genes involved in the cell cycle.

1.4 Which of the following is NOT true of somatic mutations? (*Level 2*)

A. They occur in non-germ-line cells.

B. They can be passed on to lineal descendants of the cell that was mutated**.**

C. They may occur at any time during an individual's lifetime.

D. They can be passed on from parent to child.

E. They often play a role in cancer formation.

1.5 Which of the following is NOT a type of post-translational modification? (*Level 2*)

A. A change in the base sequences of DNA

B. Cleavage of a protein product by proteases

C. Addition of lipid groups to the protein chain

D. Glycosylation

E. Methylation

1.6 The template on which ribosomes assemble the amino acids that form proteins is known as (*Level 1*)

A. hnRNA

B. messenger RNA

C. ribosomal RNA

D. DNA

E. None of the above

1.7 The expression of a given gene may be influenced by (*Level 2*)

A. Activating transcription factors

B. Enhancer sequences

C. Histone modifications

D. Changes in chromatin structure

E. All of the above

1.8 Which of the following types of changes would most likely NOT be associated with increased cancer risk? (*Level 3*)

A. A mutation resulting in higher levels of K-Ras expression

B. Reduced expression of *HOTAIR* lncRNA

C. Loss of function of the Dicer enzyme

D. A mutation in K-Ras that prevents recognition by *Let-7*

E. None of the above

1.9 Which of the following is true of orthologous genes? (*Level 1*)

A. They are genes in different species that evolved from a common ancestor.

B. They code for proteins having different functions.

C. They are genes located on the same chromosome.

D. They are related genes within the same species.

E. All of the above.

1.10 The discovery of which of the following enzymes allowed researchers to synthesize complementary DNA from mRNA *in vitro*? (*Level 1*)

A. DNA ligase

B. DNA polymerase

C. DNA synthetase

D. Reverse transcriptase

E. None of the above

1.11 Which of the following can contribute to the initiation of cancer? (*Level 2*)

A. Somatic mutations

B. Germ-line mutations

C. Gene amplification

D. Aneuploidy

E. All of the above

1.12 Which of the following would be LEAST likely to contribute to transformation of a cell? (*Level 2*)

A. A mutation resulting in a change in splicing

B. A mutation in a transcription factor

C. A silent mutation in an intron

D. An activating mutation in an exon of a gene coding for a protein that promotes cellular proliferation

E. Changes in the expression level of a miRNA that is involved in protein synthesis

Answers

1.1 B

1.2 C

1.3 C

1.4 D

1.5 A

1.6 B

1.7 E

1.8 B

1.9 A

1.10 D

1.11 E

1.12 C