

# Important Questions on Cancer Pathogenesis

**Q1. Match the following-**

<b>COLUMN A (Virus)</b>	<b>COLUMN B (human cancer type)</b>
<b>a. Papilloma</b>	<b>i. Burkitt's lymphoma</b>
<b>b. Epstein barr</b>	<b>ii. cervical carcinoma</b>
<b>c. Herpes</b>	<b>iii. Leukaemia</b>
<b>d. Retrovirus</b>	<b>iv. Nasopharyngeal carcinoma</b>

**A. a-ii, b-iv, c-i, d-iii**

**B. a-i, b-iii, c- ii, d-iv**

**C. a-iii, b-ii, c-i, d-iv**

**D. a-ii, b-i, c- iii, d-iv**

**Q2. The oncogenes which are incorporated into viral genomes usually differ from their normal, cellular counterparts. Given below are some statements regarding it, find the correct one(s)?**

**P. Their regulatory domains have point mutations that result in loss of regulation.**

**Q. They may be present in many copies as compared to single copy in cell.**

**R. They may be expressed from much stronger promoters than the normal cellular.**

**A. only P**

**B. P and Q**

**C. only R**

**D. P and R**

**Q3. Cancer generally arises from alteration of critical regulatory genes (protooncogenes) to oncogenes by various tumor viruses. Given below are some virus induced tumors. Match each tumor with their corresponding oncogene-**

**a. Simian sarcoma i. sis**

**b. Rous sarcoma ii. abl**

**c. Abelson sarcoma iii. src**

**d. CT10 sarcoma iv. crk**

**A. a-ii, b-iii, c-i, d-iv**

**B. a-i, b-iii, c- ii, d-iv**

C. a-iii, b-ii, c-i, d-iv

D. a-ii, b-i, c- iii, d-iv

**Q4. Match the following-**

<b>COLUMN A (oncogene)</b>	<b>COLUMN B (activation method)</b>
a. abl	i. point mutation
b. L- myc	ii. translocation
c. rasN	iii. DNA rearrangement
d. ret	iv. amplification

A. a-ii, b-iv, c-i, d-iii

B. a-i, b-iii, c- ii, d-iv

C. a-iii, b-ii, c-i, d-iv

D. a-ii, b-i, c- iii, d-iv

**Q5. Breast cancer is generally caused by transformation of normal breast cells by oncogenic retroviruses to cancer cells in vitro. This transformation is associated with which of the following reason?**

A. conversion of host DNA to viral RNA

B. presence of viral particles in host's membrane

C. death of host cells due to release of numerous viral particles

D. viral genome integration into host's nuclear DNA

**Q6. Given below are names of drugs used for treating cancer. Match each drug with their corresponding mode of action-**

a. Sunitinib i. angiogenesis inhibitor

b. Retinoic acid ii. Monoclonal Ab against oncogene

c. Herceptin iii. Target oncogene

d. Imatinib iv. Inhibit PDGF receptor

A. a-ii, b-iii, c-i, d-iv

B. a-i, b-iii, c- ii, d-iv

C. a-iii, b-ii, c-i, d-iv

D. a-ii, b-i, c- iii, d-iv

**Q7. Erlotinib is a potential drug generally used in the treatment of lung cancer. It works by inhibiting specific receptor. Which of the following is correct about it?**

A. potent inhibitor of EGF receptor

B. produces antibody against ErbB-2 receptor

C. potent inhibitor of PDGF receptor

D. inhibits Bcr/Abl protein tyrosine kinase

**Q8. Match the following-**

COLUMN A (drug)	COLUMN B (oncogene inhibited)
a. Retinoic acid	i. abl
b. Herceptin	ii. PML/RARa
c. Imatinib	iii. raf
d. Sorafenib	iv. erb-2

A. a-ii, b-iv, c-i, d-iii

B. a-i, b-iii, c- ii, d-iv

C. a-iii, b-ii, c-i, d-iv

D. a-ii, b-i, c- iii, d-iv

**Q9. Given below are some dugs against various types of cancer. Match each drug with their corresponding type of cancer they treat-**

a. Gefitinib i. Lung cancer

b. Sorafenib ii. Breast cancer

c. Herceptin iii. Kidney cancer

d. Erbitux iv. Colorectal cancer

A. a-ii, b-iii, c-i, d-iv

B. a-i, b-iii, c- ii, d-iv

C. a-iii, b-ii, c-i, d-iv

D. a-ii, b-i, c- iii, d-iv

**Q10. Herceptin was the first drug which is primarily a monoclonal antibody against the ErbB-2 oncogene protein and is widely used in treatment of breast cancer. Given below are some statements regarding this drug. Which statement(s) is correct?**

**P. produces antibody against a receptor protein tyrosine kinase**

**Q. helps in elevating ErbB-2 levels**

**R. inhibit proliferation of cells in which ErbB-2 is overexpressed**

**A. only P**

**B. P and Q**

**C. only R**

**D. P and R**

ANSWERS

1. A
2. D
3. B
4. A
5. A
6. B
7. A
8. A
9. B
10. D

**SOLUTION**

**Solution-1**

COLUMN A (Virus)	COLUMN B (human cancer type)
a. Papilloma	ii. cervical carcinoma
b. Epstein barr	iv. Nasopharyngeal carcinoma
c. Herpes	i. Burkitt's lymphoma
d. Retrovirus	iii. Leukemia

**Solution-2**

The oncogenes which are incorporated into viral genomes usually differ from their normal, cellular counterparts. Their regulatory domains have point mutations that may result in loss of protein regulation. They may be expressed from much stronger promoters than the normal cellular promoter. Hence, D is correct option.

**Solution-3**

- a. Simian sarcoma i. sis
- b. Rous sarcoma iii. src

- c. Abelson sarcoma ii. abl
- d. CT10 sarcoma iv. Crk

**Solution-4**

COLUMN A (oncogene)	COLUMN B (activation method)
a. abl	ii. translocation
b. L- myc	iv. amplification
c. rasN	i. point mutation
d. ret	iii. DNA rearrangement

**Solution-5**

Cancer generally arises from alteration of critical regulatory genes (protooncogenes) to oncogenes by various retro- viruses. Breast cancer is generally caused by transformation of normal breast cells by oncogenic retroviruses to cancer cells in vitro. This transformation is associated with viral genome integration into host’s nuclear DNA. Hence, D is the correct option.

**Solution-6**

- a. Sunitinib i. angiogenesis inhibitor
- b. Retinoic acid iii. Target oncogene
- c. Herceptin ii. Monoclonal Ab against oncogene

**d. Imatinib iv. Inhibit PDGF receptor**

**Solution-7**

Erlotinib is a potential drug generally used in the treatment of lung cancer. It works by inhibiting EGF receptor. It has shown good activity against the subset of lung cancer where the EGF receptor is activated by point mutations. Along with this, gefitinib is also a potent drug for treatment of lung cancer with similar mode of action that of erlotinib. Hence, A is the correct option.

**Solution-8**

COLUMN A (drug)	COLUMN B (oncogene inhibited)
a. Retinoic acid	ii. PML/RARa
b. Herceptin	iv. erb-2
c. Imatinib	i. abl
d. Sorafenib	iii. raf

**Solution-9**

- a. Gefitinib i. Lung cancer
- b. Sorafenib iii. Kidney cancer

c. Herceptin ii. Breast cancer

d. Erbitux iv. Colorectal cancer

**Solution- 10**

Herceptin was the first drug which is primarily a monoclonal antibody against the ErbB-2 oncogene protein and is used in treatment of breast cancer. It produces monoclonal antibody against the extracellular domain of receptor protein tyrosine kinase i.e. ErbB-2. It inhibits proliferation of cells in which ErbB-2 is overexpressed and lowers the level of ErbB-2. Hence, D is the correct option

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