

MCB 135G Biology of Human Cancer.
SPRING 2004
MIDTERM I

INSTRUCTIONS:

The test should be written in pens with non erasable ink only. Use of Pencils and erasable ink is not allowed.

Please do not begin the test until all students have received the exam questions and you are instructed to begin.

*Please PRINT your full name and SID # **clearly** on the blue books.*

*Regrades are due **POSITIVELY** one week after the tests are returned. Regrade requests should be typed. Hand written comments are not acceptable.*

Good luck!

I. Distinguish between the following: 5x2=10 pts

- a. c-oncogene vs v-oncogene
- b. Anaplastic tumor vs Metastatic tumors
- c. Seminoma vs Melanoma
- d. Spontaneous Tumor vs Induced Tumor
- e. Carcinogen vs Carcinoma

2 a. Why do most cancers occur in people over 65 years of age? List 4 possible reasons. (4x2=8 pts)

b. In certain situations, benign tumors can be life threatening. List three such situations. (3x2=6pts)

3 a. How are permanent cell lines generated in vitro? (2 pts)

b. What are the various stages normal mouse cells must go through to become a cell line? (4 pts)

c. What are the various stages normal human fibroblasts go through during serial passaging in vitro? (4 pts)

d. What are the unique characteristics of cell lines compared to normal cells in culture? List 4 characteristics. (8 pts)

4 a. Describe an experiment that showed that the T antigen products of the SV 40 virus are involved in viral replication. (6 pts)

b. Describe an experiment showing that the SV 40 T antigen products are also involved in neoplastic transformation. (4 pts)



- c. What are the functions of the large T antigen of the SV 40 virus in transformation? (2 pts)
5. Develop a simple hypothesis of carcinogenesis based on each of the following statements: $4 \times 2 = 8$ pts.
- Japanese American women have significantly higher incidence of breast cancer compared to native Japanese women.
 - A small proportion of malignant breast cancers occurs in women before the age of 30. Most of the rest of them occur in women of over 60 years of age.
 - Understanding the mechanisms of virally induced tumors have helped generate a new hypothesis of human carcinogenesis.
 - All cell lines are immortal.
6. a. Define the term provirus associated with retroviral replication. (4 pts)
- What experimental observations led Temin to postulate the proviral hypothesis. (6 pts)
 - Draw the genetic map of a replication competent acutely transforming virus and its proviral form. (4 pts)
 - Describe the stepwise sequence of events in the replication of this virus in a permissive cell. (6 pts)
7. State if true or false: $9 \times 2 = 18$ pts
- Hematopoietic cancers are the most common cancers in men in the USA.
 - Aneuploidy is a necessary feature of all cell lines.
 - All DNA viral oncogenes have a cellular homolog.
 - Viral replication always precedes polyoma virus induced transformation.
 - Hepatoma undergoes expansile growth.
 - Most colon cancers are hereditary in nature.
 - Tumor cells always divide at a faster rate than all normal cells.
 - The incidence of cancer is always the same in immunodepressed as well as immunocompetent populations.
 - Members of a single ethnic population, born and living in different countries have similar incidences of different cancers.

