BiS200 Quiz#3 (2024-05-01) (Answer in English, Closed book, 15 minutes)

Fill-in-the-blank questions:

1. (Oncogene) is a gene that, when mutated or expressed at abnormally high levels, contributes to converting a normal cell into a cancer cell.
2. Unlike surgery and radiation therapy, (chemotherapy drugs) are typically given systemically, acting on any cells within the body.
3. The blood serum from animals that are immunized contains (polyclonal) antibodies against the antigen, while antibodies produced by hybridomas are (monoclonal) antibodies.

Short-answer questions:

1. In the TNM cancer staging system, what do "T," "N," and "M" represent, respectively?
    1. "T" stands for Tumor and describes the size of the original tumor and whether it has invaded nearby tissue.
    2. "N" stands for Nodes and describes whether the cancer is present in the lymph nodes.
    3. "M" stands for Metastasis and indicates whether the cancer has spread to other parts of the body.
2. How does radiation therapy selectively target cancer cells while minimizing damage to surrounding normal cells?
    1. Radiation therapy affects cancer cells more significantly than normal cells because cancer cells are more prone to DNA damage and are less efficient at repairing this damage.
    2. Additionally, radiation therapy is administered using dose fractionation and spatial focusing to target the cancer cells precisely, minimizing exposure to surrounding healthy tissues.
3. What are the key differences between chemotherapy and targeted therapy?
    1. Chemotherapy: Uses drugs that kill cells that are rapidly dividing, which generally includes cancer cells but can also affect normal cells that divide quickly, such as those in hair follicles and the digestive tract. This can lead to broader systemic side effects.
    2. Targeted Therapy: Uses drugs or other substances specifically designed to attack cancer cells by inhibiting specific targets associated with cancer, such as tyrosine kinases. The effects of targeted therapy are generally more selective, leading to fewer side effects compared to chemotherapy.
4. What is the purpose of the constant region in an IgG antibody?
    1. To define the antibody's class and facilitate its effector functions