

Cell Regulation and Cancer

Read Chapter 5.4

Fill in the blanks

1. An overgrowth of cells is called a _____.
2. A _____ tumour is not cancerous.
3. Some of the most common carcinogens:
 - a. _____ - found in some pesticides, herbicides, and cleaning products
 - b. _____ - a fungus that can grow on raw nuts
 - c. _____ - most common are hepatitis, HIV, and HPV
 - d. _____ - found in plastics
 - e. _____ - x-rays
 - f. _____ - found in charred meat
4. List 3 major lifestyle factors that can increase the risk of cancer cell development:
 - a. _____
 - b. _____
 - c. _____
5. The root cause of cancer is _____
6. The cell cycle is controlled by _____ that ensure the full completion of one phase before advancing to the next phase.
7. Checkpoints are points in the cell cycle where proteins are involved in searching for DNA _____.
8. If a DNA mutation is found, the cell cycle becomes _____ at that stage.
9. If a mutation occurs then either the mutation is _____ or the cells dies in a process called _____.
10. The _____ checkpoint looks for mutations before DNA replication begins.
11. The _____ checkpoint looks for mutations after DNA replication occurred.
12. Replication mistakes can be quite high, therefore we have many DNA _____ enzymes that can fix mutations.
13. The final checkpoint occurs during _____.
14. _____ occurs when mutated cells continue to divide and are not regulated by the cellular checkpoints.

15. Cancer cells usually have 2 or more of the following characteristics:
- Up-regulated genes called _____ that increase the cell cycle.
 - Cells do not have a normal lifespan and become _____.
 - They spread to other parts of the body through a process called _____.
 - Cause an increase in new blood vessels called _____.
16. Genes that normally increase the rate of cell division, such as during wound healing or growth, are called _____ - _____, when those normal genes become mutated and then increase cell division when they shouldn't, they are called _____.
17. Genes that normally prevent cell division from continuing at checkpoints if a mutation is detected are _____ - _____ genes.
18. The study of cancer is called _____.
19. A substance that mutates DNA is called a _____ and a substance that mutates DNA in a way that causes cancer is called a _____.
20. Approximately _____% of cancers are caused by inherited mutations, _____% are caused by environmental factors.
21. An important tumour-suppressor gene is called _____ and acts at the _____ checkpoint.
22. Normally p53 has 3 main functions:
- Recognize _____ and stop the cell cycle
 - Recruit DNA _____ enzymes
 - Trigger programmed cell death, called _____
23. If p53 is mutated then 2 things can occur:
- _____
 - _____
24. If cancer cells develop, immune cells called _____ cells as well as _____ can kill them.
25. Chronic stress can impact cancer cell growth because stress causes the production of cortisol that inhibits the _____ system.