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| Mutations  Types of Mutations  \_\_\_\_\_\_\_\_\_Mutations  \_\_\_\_\_\_\_\_\_Mutations  \_\_\_\_\_\_\_\_\_ Mutations | 63   * **change in the\_\_\_\_\_\_ or \_\_\_\_\_\_\_ sequence** * **May result in new \_\_\_\_\_\_** * **Important for\_\_\_\_\_\_\_\_\_\_\_\_**    + Can be \_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_ * **May be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (due to \_\_\_\_\_\_\_\_\_\_ during transcription/translation or mitosis/meiosis)** * **May be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ endued!** * **There are also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mutations, large changes with \_\_\_\_\_\_\_\_\_\_\_ effects.** * **\_\_\_\_\_\_\_\_ mutations** * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mutations (Mutations that disrupt the reading frame by insertions or deletions of a non-multiple of 3 nucleotide bases.)** * **\_\_\_\_\_\_\_\_\_\_\_ alterations** * **They lead to \_\_\_\_\_\_\_ versions of \_\_\_\_\_\_\_\_\_\_\_\_ that help organisms**   **\_\_\_\_\_\_\_\_\_ to changes in their environment.**   * **\_\_\_\_\_\_\_\_\_\_\_ for evolution** * **increase an organism’s changes of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_** * **Example: Mutations in many \_\_\_\_\_\_\_\_\_\_\_\_ that allow them to survive in the presence of \_\_\_\_\_\_\_\_\_\_\_\_ drugs.**   **The mutations lead to antibiotic-\_\_\_\_\_\_\_\_\_\_\_ strains of bacteria.**     * **When a mutation \_\_\_\_\_\_\_ a protein that plays a \_\_\_\_\_\_\_\_\_ role in the cell it may not function properly, resulting in a \_\_\_\_\_\_\_\_\_\_\_ condition.** * **Harmful mutations may cause genetic disorders or \_\_\_\_\_\_\_\_\_\_\_.** * **A genetic disorder is a \_\_\_\_\_\_\_\_\_ caused by a \_\_\_\_\_\_\_\_\_\_\_\_ in one or a few genes.** * **Example: \_\_\_\_\_\_\_\_\_\_\_. A mutation in a single gene causes the body to produce thick, sticky mucus that clogs the \_\_\_\_\_\_\_\_\_ and blocks ducts in digestive organs.**   **\_\_\_\_\_\_\_\_\_\_\_ is a disease in which cells \_\_\_\_\_\_\_\_\_ out of control and form \_\_\_\_\_\_\_\_\_\_\_ masses of cells. It is generally \_\_\_\_\_\_\_\_\_\_\_ by mutations in genes that \_\_\_\_\_\_\_\_\_\_ the cell cycle. Because of the mutations, cells with \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_ are allowed to divide without limits. Cancer genes can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_.**   * **Cancer is caused by a \_\_\_\_\_\_\_ of mutations** * **Cells have developed a number of control mechanisms to \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_** * **A mutation in \_\_\_\_\_ proto-oncogene would \_\_\_\_\_\_\_\_\_ cause cancer** * **effects would be \_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_ and tumor \_\_\_\_\_\_\_\_\_\_\_\_\_\_ genes.**      * **\_\_\_\_\_\_\_\_\_\_ for cell growth overwhelm the signals for growth \_\_\_\_\_\_\_\_\_\_\_\_, and the cell quickly spirals out of control** * **(Often, because many of these genes \_\_\_\_\_\_\_\_\_\_\_ the processes that prevent most \_\_\_\_\_\_\_\_\_\_\_\_\_ to the genes themselves, DNA damage accumulates as one \_\_\_\_\_\_.)**      * **Cancers are caused by a series of mutations. \_\_\_\_\_ mutation alters the behavior of the \_\_\_\_\_\_.** * **For example, the \_\_\_\_\_\_\_\_ mutation\_\_\_\_\_\_\_\_\_\_\_\_ a tumor suppressor gene, the second mutation \_\_\_\_\_\_\_\_\_\_\_\_ a DNA \_\_\_\_\_\_\_\_\_ gene, the third mutation creates an \_\_\_\_\_\_\_\_\_\_\_, and a fourth mutation inactivates several more tumor suppressor genes, resulting in \_\_\_\_\_\_\_\_\_\_\_.** |
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