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Course: BT-605 (Quiz)
Total marks-20

Date: 20/08/2024
Total time: 60 mins

Q1. A lymphocytic cell population isolated from an HIV patient showed upregulation of a protein named BT615. where 615 is the nucleotide length of a gene that encodes the protein. The dimeric form of the BT615 can bind to ***gag*** protein of HIV. Scientists want to mimic the work in a lab condition with an ***ecotropic*** virus. Discuss the methodology and possible outcome of the experiment. (3 Marks)

Q2. A newly isolated virus is hypothesized to be integrated into the mitochondrial DNA and NOT nuclear DNA. What could be the possible explanation for the virus adopting this unique strategy? What could be the possible ways to prove the hypothesis (3 Marks)

Q3. A patient undergoing somatic *in-situ* gene therapy against ***LEUKODERMA*** suddenly developed an MHC-II-mediated immune response. What could be the reason for this reaction, and how could the patient be diagnosed? (3 Marks)

Q4. What do you mean by ***HYPOKALEMIA***? Predict the symptoms of the disease and possible organs affected the most. What if the BT615 protein in question number 1 is getting downregulated in this condition? Can you correlate the hypokalemia with HIV? (3 Marks)

Q5. A scientist was visualizing a chemical sample for carcinogenicity under a bacterial culture; S/he observed bacterial cells to be motile in the treatment group while the bacteria in the untreated groups were non-motile. Discuss your interpretation (3 Marks)

Q6. A person is diagnosed with a missense mutation in the SUMO protein gene, making it a gain-in functional mutant. What cellular problems would you predict in the patient? (3 Marks)

Q7. How will you clone the gene that controls the antidiuretic hormone secretion? How will you test it in animals as a gene knock-in model (2 Marks)