

## CSIR Life Science Sample Questions (Part 7 of 10)

1. The hydrolysis of pyrophosphate to orthophosphate is important for several biosynthetic reactions. In *E. Coli*, the molecular mass of the enzyme pyrophosphatase is 120kD, and it consists of six identical subunits. The enzyme activity is defined as the amount of enzyme that hydrolyzes 10  $\mu\text{mol}$  of pyrophosphate in 15 minutes at 37°C under standard assay condition. The purified enzyme has a  $V_{\text{max}}$  of 2800 units per milligram of the enzyme. How many moles of the substrate are hydrolysed per second per milligram of the enzyme when the substrate concentration is much greater than  $K_m$ ?
  - a. 0.05  $\mu\text{mol}$
  - b. 62  $\mu\text{mol}$
  - c. 31.1  $\mu\text{mol}$
  - d. 1  $\mu\text{mol}$
2. For continuation of protein synthesis in bacteria, ribosomes needs to be released from the mRNA as well as to dissociate into subunits. These processes do not occur spontaneously. They need the following possible conditions:
  - a. RRF and EF-G aid in this process.
  - b. An intrinsic activity of ribosomes and an uncharged tRNA are required.
  - c. IF-1 promotes dissociation of ribosomes.
  - d. IF-3 and IF-1 promote dissociation or ribosomes.

Which of the following sets is correct?

- a. 1 4
  - b. 1 2
  - c. 1 3
  - d. 2 4
3. A bacterial response regulator turns on gene A in its phosphorylated form. The amount of "A" shows a sharp and steep rise at a threshold concentrations of the signal sensed by the cognate sensor. This is most likely due to

- a. increased phosphatase activity of the sensor at the threshold concentration.
  - b. decreased phosphorylation of the response regulatory by the sensor.
  - c. cooperativity in binding of the response regulator to the target gene A.
  - d. negative feed back in gene A expression.
4. You are given a group of four mice. Each mouse is immunized with keyhole limpet hemocyanin or azobenzene arsonate or lipopolysaccharide or dextran. Four weeks later, sera were collected from these mice and antigen-specific IgG1 and IgG2a ELISA were performed. Only one of the mice showed positive response. It was
- a. keyhole limpet hemocyanin-primed mouse
  - b. azobenzene arsonate-primed mouse
  - c. lipopolysaccharide-primed mouse
  - d. dextran-primed mouse

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