

Biotechnology and its Applications



TRY YOURSELF

ANSWERS

1. Spores of *Bacillus thuringiensis* produce the insecticidal cry protein. The protein exist as inactive protoxin but once an insect ingests the inactive toxin it is converted into an active form of toxin due to the alkaline pH of the alimentary canal that solubilises the crystals. The activated toxin finally cause death of the insect.
2. Insulin from an animal source caused some patients to develop allergy or other types of reactions to the foreign protein, whereas recombinant human insulin is identical with human insulin.
3. In 1983, Eli Lilly first prepared two DNA sequences corresponding to A and B chains of human insulin and introduced them in plasmids of *E. coli* to produce insulin chains. Chains A and B were produced separately, extracted and combined by creating disulphide bonds to form human insulin or humulin.
4. Many transgenic animals are developed to increase our understanding of how genes contribute to the development of disease so that investigation of new treatments for diseases

is made possible. Today transgenic models exist for many human diseases such as cancer, cystic fibrosis, rheumatoid arthritis, alzheimer's disease, haemophilia, thalassaemia, etc.

5. DNA of a fluorescent jelly fish was introduced into an unfertilised egg of a Rhesus monkey in the test tube. The diploid egg underwent cleavage and the early embryo was implanted in a surrogate mother.
6. The advantages of using bioweapons are:
 - (i) They are low cost weapons.
 - (ii) They cause far more casualties than chemical or conventional weapons. Once bioweapon agents are released they are invisible, odourless and tasteless.
7. Biopatents are awarded for (i) strains of microorganisms, (ii) cell lines, (iii) genetically modified strains of plants and animals, (iv) DNA sequences, (v) proteins encoded by DNA sequences, (vi) various biotechnological procedures, (vii) production processes, (viii) products and (ix) product applications.

