

Tutorial N°8**Exercise I : Multiple Choice Questions (MCQ)****QCM1. Which field uses stem cells and gene therapy?**

- A. Industrial biotechnology
- B. Agricultural biotechnology
- C. Medical biotechnology
- D. Environmental biotechnology

Answer:**QCM2. Which of the following is an example of a monoclonal antibody?**

- A. Penicillin
- B. Trastuzumab
- C. Insulin
- D. HPV vaccine

Answer:**QCM3. What is the main advantage of biopharmaceuticals?**

- A. High toxicity
- B. Low specificity
- C. High specificity and lower toxicity
- D. Easy chemical synthesis

Answer:**QCM4. Which organism is commonly used to produce recombinant insulin?**

- A. Fungi
- B. Escherichia coli
- C. Plants
- D. Viruses

Answer:**QCM5. What is the role of Bt crops?**

- A. Increase sugar production
- B. Improve taste
- C. Resist insect pests
- D. Increase water usage

Answer:**Exercise II: Short Answer Questions****Q1. Define medical biotechnology.****Answer:****Q2. What is gene therapy used for?****Answer:****Q3. Give two examples of biopharmaceutical molecules.****Answer:**

Q4. What is fermentation in industrial biotechnology?

Answer:

Q10. What is bioremediation?

Answer:

Exercise III: Complete the table:

Molecule Type	Example	Function
Recombinant proteins	?	Metabolic regulation
Monoclonal antibodies	Trastuzumab	?
Antibiotics	Penicillin	?

Answer:

Molecule Type	Example	Function
Recombinant proteins		Metabolic regulation
Monoclonal antibodies	Trastuzumab	
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Exercise IV: Application / Thinking Questions

Q1. Why are mRNA vaccines considered a major breakthrough?

Answer:

Q2. How does biotechnology help reduce environmental pollution?

Answer:

Q3. Why are GMOs important in agriculture?

Answer:

Q4. Compare medical and agricultural biotechnology (2 differences).

Answer: