

Lecture-I

Fundamentals of Biology and Biotechnology

1. How biology is differing from biotechnology?

Answer: The fundamental difference between biology and biotechnology is that biology is a science, whereas biotechnology is an industry. Specifically, biology is the branch of science concerned with living things whereas biotechnology is an industry which applies biology to the solution of real world problems.

2. What are the different branches of biotechnology?

Answer: A series of derived terms have been coined to identify several branches of biotechnology, for example:

- Bioinformatics
- Blue biotechnology
- Red biotechnology
- Green biotechnology
- White biotechnology

3. Briefly discuss on the Whittaker's five kingdom classification?

Answer: The present trend in biology is to follow the five kingdom classification proposed by R.H. Whittaker in the year 1969. Whittaker classified the living organisms into five kingdoms namely.

1. KINGDOM: MONERA (prokaryotic organisms)

2. KINGDOM: PROTISTA (primitive eukaryotic organisms)

3. KINGDOM: MYCOTA (exclusively fungi)

4. KINGDOM: METAPHYTA (advanced eukaryotic plants)

5. KINGDOM: METAZOA (all multicellular animals)

4. How plant biotechnology is different from agricultural biotechnology?

Answer: Agricultural biotechnology, which broadly includes areas of development of transgenic crops, structural and functional genomics and marker-assisted breeding could provide us with the vital breakthroughs to achieve improvements in both quality and quantity in a sustainable manner.

Plant biotechnology is the art and science of changing the genetics of plants for the benefit of humankind.

5. Discuss about the different applications of biotechnology in our modern life?

Answer: Biotechnology is, simply put, technology which uses or is based on biology. There are four main types of biotechnology applications: medicine, agriculture, biological engineering, and bioremediation. Each of these combines one or more different scientific disciplines, such as genetics, molecular biology, robotics and chemical engineering, in a unique and highly practical mix of biological and physical sciences.