

## 513. MICROBIOLOGY

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Scope and importance of Microbiology, Spontaneous generation-biogenesis theory; Germ theory of diseases; Recent developments of Microbiology, Principles of microscopy, Principles of staining, Culture media, Sterilization methods, Isolation of pure cultures, maintenance and preservation of microbial cultures, Morphology and ultra-structure of typical eubacterial cell, Bacterial classification, Discovery and nature of viruses; TMV, HIV, T4 and lambda phages. Cultivation and assay of phages, plant and animal viruses, Nutritional types of bacteria, Bacterial growth, Respiration, Fermentation, Antibiotics, DNA and RNA structures and their role as genetic materials, Transcription and translation, Lac operon, Bacterial plasmids and transposons, DNA damage and repair mechanisms, Mutations, gene transfer mechanisms in bacteria, Recombinant DNA technology. Types of immunity, Organs of immune system, Cells of immune system, Antigens, Antibodies, Antigen toxins, virulence and attenuation, Airborne diseases, Food and water borne diseases and Blood borne diseases. General principles of diagnostic microbiology. Elements of chemotherapy-therapeutic drugs, Drug resistance. Microorganisms in relation to plant growth and biological control, Biological nitrogen fixation, Bio fertilizers. Microorganisms of the environment (soil, water and air), Microbial interactions. Microbiology of potable and polluted waters. Microorganisms of food spoilage and their sources. General account of food, Preservation. Microorganisms as food – SCP, edible mushrooms. Screening and isolation of industrially useful microbes, strain improvement and fermentation. Fermentor, Immobilization Industrial production of Alcohols, Glutamic acid, Citric acid, Vitamin B12, Enzymes, and Antibiotics. Biomolecules; Carbohydrates, aminoacids, proteins, Biochemical techniques.

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