

OBJECTIVES: To enable the students to –

- Attain the clear idea about the categorization of microorganisms.
- Know the nutrition and growth pathways of microorganisms.
- Differentiate the both innate and adaptive immunities.
- Confirm disease diagnosis by serology.

I. Learning outcomes:

1. Will acquire knowledge on discovery and classification of microorganisms
2. Understands the microbial nutrition, and growth pattern
3. Compare the key mechanism of innate and adaptive immunity
4. Apply knowledge in disease diagnosis through serological tests

UNIT-I: Introduction to Microbiology

1. Discovering the microbial world.
2. Classification of microorganisms up to order level - bacteria, algae, fungi, protozoa.
3. Structure of prokaryotic and eukaryotic microorganisms.
4. Isolation, cultivation and enumeration of microorganisms - direct and indirect methods,
5. Maintenance of culture

UNIT – II: Microbial nutrition

1. Nutritional requirements to microorganisms - Mode of nutrition
 - a) phototrophy,
 - b) chemotrophy
 - c) methylotrophy
 - d) organotrophy
 - e) mixotrophy
 - f) saprophytic
 - g) Symbiotic and parasitic.
2. Interaction of microbes.
3. Control of microorganisms – principles: physical and chemical agents,
4. Assay of antimicrobial action.

UNIT – III: Immunology

1. Immunity- innate and acquired, innate immune mechanisms.
2. Acute phase reactants.
3. Properties of acquired immunity.
4. Toll-like receptors.
5. Immunogens and antigens – Properties, factors governing immunogenicity,
6. Haptens, epitopes-size and identification.
7. Adjuvants-types, properties and mechanism of action.

UNIT – IV: Cells of the immune system

1. Cells involved in the immune response- T cells, B cells, CD antigens, neutrophils, eosinophils and natural killer cells.
2. Macrophages, dendrites, Phagocytosis.
3. Lymphoid tissues- Primary and secondary lymphoid organs, structure and cellular organization.
4. Lymphocyte traffic.

UNIT V: Antigen-Antibody interactions

1. Antigen- Properties, antibody structure, types.
2. Antigen and antibody interactions- affinity of antibody, avidity, bonus effect, classical precipitin reaction, antigen-binding site of antibody, forces involved in antigen-antibody complex formation.
3. Generation of antibodies, Monoclonal and polyclonal antibodies.
4. Production of monoclonal antibodies and their clinical significances.

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