

BBM-202 PAPER-2: VIROLOGY & IMMUNOLOGY

UNIT-I

Viruses - Classification, nomenclature, structure, replication and diseases caused by them. Methods of detection, cultivation - Chick embryo, animal inoculation, tissue culture, quantitation - propagation, maintenance of viruses. Viruses containing deoxyribonucleic acid (DNA) & ribonucleic acid (RNA). Virion - Size, shape, structure, symmetry and chemical composition, prions, viroids. Viral coefficient. Plant viruses - Classification, structure and replication of plant viruses, TMV, cauliflower mosaic.

UNIT-II

Bacterial viruses - Structure and replication of RNA and DNA bacteriophages, ϕ X 174 phage, T4 phage, lambda phage lytic and lysogenic cycle, Ff phage, MS2, F2, QB, Mu phages. Animal virus infection on host, viral interference and interferon. Interferon - Nomenclature, types and classification. Induction of interferon, types of inducers. Unclassified viruses - Hepatitis viruses. Oncogenic viruses (tumor viruses) - DNA containing oncogenic viruses, papova, human adenovirus. RNA containing oncogenic viruses, retroviruses (oncornaviruses), AIDS virus. Inactivation of viruses - Photodynamic inactivation, physical and chemical agents, chemotherapeutic agents.

UNIT-III

Cellular immunology - Infection and immunity, components of immune system cell types and organs. Nature of immunity, specificity, immunological memory, duality of immune systems. Phylogeny and ontogeny of immunity. Cell lineage - Bone marrow, thymus, spleen, lymph nodes. Types of immune cells, B-lymphocytes, T-lymphocytes, macrophages, cell mediated immunity and lymphokine activated killer cells, clonal nature of the immune response - clonal selection theory. Reactions of immunity - Antitoxins, neutralization of toxin with antitoxin; agglutinins and agglutination reactions, precipitants; lysins; complement - fixation reaction, classic and alternate pathways and functions. Opsonins and opsonocytophagic reaction.

UNIT-IV

Chemical aspects of immunology - Nature of antigens; antibody structure, classification of antibodies and functions of IgG, IgA, IgM, IgD and IgE; primary and secondary immune response; serological analysis of antibodies - isotypes, allotypes and idiotypes. Antibody diversity, antigen receptors on B and T lymphocytes. Major histocompatibility complex (MHC). Human leucocyte antigen (HLA) restriction, lymphokines. ELISA, RIA, immuno blot, immunofluorescence, agglutination, precipitation in liquids and semisolids (Ouchterlony technique), immunodiffusion, immunoelectronmicroscopy.

UNIT - V

Immunology - Hypersensitivity reaction - immediate and delayed type hypersensitivity reactions. Factors of specific resistance, anti and auto antibodies.