MBPG06 - IMMUNOLOGY

Number of Hours / Week: 4 **Credits: 4**

UNIT I

Infection, Source of infection, Methods of transmission. Immunity, Types of immunity. Mechanisms of innate immunity- barriers, inflammation, phagocytosis-mechanisms, Pattern recognition receptors - Scavenger receptors and the Toll-like receptors etc. Organs and cells with immune functions. Lymphocytes and lymphocyte maturation.

UNIT II

Antigens, Antigenicity, Epitopes, Antibodies, Immunoglobulin – structure, classes and functions Fc receptors. Monoclonal antibodies – production and application, Antibody engineering. Antigenic determinants on Ig- Isotype, Allotype, Idiotype. Genetic basis of antibody diversity, Organization and Expression of Immunoglobulin Genes, V(D)J rearrangements; somatic hypermutation and affinity maturation, Class-switching, Antigen-antibody reactions, Agglutination, Precipitation, Complement fixation, Radioimmuno assay, Immunoflourescence, ELISA, Western blotting, Flow cytometry etc.

UNIT III

Receptors on T and B cells for antigens, MHC, Antigen processing and presentation, Complement system, Complement activation, regulation, Biological effects of complements, B cell- generation, activation, differentiation, Humoral Immune response- Antibody formation, Primary and secondary immune response, Clonal selection theory. T-cell maturation, activation and differentiation, Cell mediated Immune response, Cytokines, Primary and secondary immune modulation

UNIT IV

Immunology of organ and tissue transplantation- Allograft reaction and GVH reaction, Factors influencing allograft survival, Immunology of malignancy- Tumor antigens, Immune response in malignancy, Immunotherapy of cancer, Immunohematology- ABO and Rh blood group system, Immunology of blood transfusion, Hemolytic disease of new born.

UNIT V

Immunological Tolerance, Autoimmunity- Mechanisms of autoimmunity, Autoimmune diseases. Inflammation, Hypersensitivity– immediate and delayed reactions, Clinical types of hypersensitivity, Immunodeficiency diseases, Immunoprophylaxis- Vaccines –types of vaccines, DNA vaccine and recent trends in vaccine development. Immunoregulation

References

1. Roitt IM & Delves PJ (2001) *Roitt's essential Immunology*.Blackwell Science, Oxford. 10th ed.
2. Kindt TJ, Goldsby RA, Osborne BA, & Kuby J (2006) *Kuby Immunology*.W.H. Freeman, New York. 6th ed
3. Murphy K, Travers P, Walport M, & Janeway C (2008) *Janeway's Immunobiology*. Garland Science, New York. 7th ed
4. Chapel H (2006) *Essentials of clinical Immunology* .Blackwell, Malden, Mass. ; Oxford. 5th ed
5. Kimball JW (1986) *Introduction to Immunology*.Macmillan, London 2nd ed
6. Paniker CKJ (2006) *Ananthanarayan & Paniker's Textbook of microbiology*. Orient Longaman. 7th ed.