IMMUNOTECHNOLOGY

BIOT-802 IMMUNOBIOLOGY

1. Introduction to the study of Immunology- History and scope of Immunology; Recogntion of self and non-self; Types of immunity-Innate and Acquired.

2. Cells and Tissues of the Immune System: cells of lymphoid and myeloid lineage, their development and role in immune response. Primary and secondary lymphoid tissues –structure and function in relation to the development of immune effector cells. Cellular traffic among immune organs during development, Role of APCs.

3. Antigens and Immunogenicity. Nature and characteristics of Antigens, antigenic determinants, size of epitope, carrier effect , role of adjuvants and mitogens in immune response.

4. Humoral Immunity: Development of B cells: somatic hypermutation, Role of T cells in B cell development-affinity maturation , class switching, memory cell formation etc. Immunoglobulins- Types, subtypes and their structure.

5. Properties and functions of different classes of Immunoglobulins, immunoglobulins as Antigens;Theories of antibody formation; structural and Genetic basis of Antibody diversity.

6. Antigen- Antibody interaction: Primary and secondary reactions-methods for the detection of Ag-Ab reaction- Principle of RIA, ELISA. Principle and applications of techniques based on agglutination and precipitation- Bacterial agglutination, haemagglutination, passive haemagglutination, double immunodiffusion (DID), SRID, Immunoelectrophoresis, etc.

7. Complement and its role in Immune Responses- complement classes, activation of complement cascade by classical and alternate pathway, complement receptors and complement effector functions.

8. Cellular Immunity (CMI):Phagocytosis -role of macrophages, neutrophils, eosinophils; ADCC; T lymphocytes-MHC restriction, role of TH1 and TH2 subsets of helper T cells in immune response, mechnism of action of cytotoxic T lymphocytes(CTL),apoptosis. Regulatory role of cytokines released by macrophages and T helper cells.

9. Immunomodulation: Immune tolerance, Immunosuppression, and Immune deficiencies

10. Hypersensitivity-Type I ,II,III &IV hypersensitivities; Autoimmune diseases.