

**Post Graduate Government College for Girls, Sector-42, Chandigarh**

**Teaching Plan for Bachelors (Third and Fifth Semester) and Post Graduate (Third Semester)**

**Session (2020-2021)**

**Class:** B.Sc. Biotech(Hons.) 3rd SEM (2<sup>nd</sup> Yr)

**Name of the Teacher:** Dr. Sunita Kumari

**Subject:** Immunology-I

**Paper:**

S. No	Dates	Topics to be Covered
Week 1	03/08/2020 – 08/08/2020	<b>Introduction</b> i) Overviews of immune system – Historical perspectives ii) Innate and acquired immunity
Week 2	10/08/2020 – 14/08/2020	Clonal nature of immune response.
Week 3	17/08/2020 – 22/08/2020	<b>Cells of the immune system :</b> Hematopoiesis and differentiation
Week 4	24/08/2020 – 29/08/2020	Lymphocyte trafficking, B-lymphocytes, T-lymphocytes, macrophages, dendritic cells, Natural killer cells and lymphocyte activated killer cells
Week 5	31/08/2020- 05/09/2020	eosinophils, neutrophils& mast cells
Week 6	07/09/2020- 12/09/2020	<b>Organs of the immune system :</b> Primary and secondary lymphoid organs,
Week 7	14/09/2020- 19/09/2020	Systemic function of immune system <b>Lymphocyte Trafficking:</b> Cell surface proteins, Cell Adhesion molecules ( Integrin, Selectin, Cadherin family and Ig Superfamily).
Week 8	21/09/2020- 26/09/2020	<b>Antigen</b> – Immunogenicity Vs. antigenicity, factors effecting immunogenicity, nature of immunogen,
Week 9	28/09/2020- 03/10/2020	epitopes, heptans and antigenicity, pattern recognition receptors
Week 10	05/10/2020- 10/10/2020	<b>Immunoglobulins:</b> Structure of antibody, antibody effector function, antibody classes and biological activities, antigenic determinants on Immunoglobulins,
Week 11	12/10/2020- 16/10/2020	Immunoglobulins superfamilies. <b>Major histocompatibility complex:</b> General organization and inheritance
Week 12	19/10/2020- 24/10/2020	cellular distribution, regulation of MHC expression and disease susceptibility
Week 13	27/10/2020- 30/10/2020	antigen presentation, Production of Monoclonal Antibodies, applications of polyclonal and monoclonal antibodies
Week 14	03/11/2020- 07/11/2020	Strength of interaction, cross reactivity, antibody affinity, avidity
Week 15	09/11/2020- 12/11/2020	Antigen-antibody interactions as tools for research and diagnosis: precipitation and agglutination reactions
Week 16	16/11/2020- 21/11/2020	Immunodiffusion, immunoelectrophoresis. immunoassays, Enzyme linked immunosorbent assay (ELISA),
Week 17	23/11/2020- 28/11/2020	Radioimmunoassay (RIA), Western blot, Immunofluorescence.

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**Name of the Teacher:** Dr. Sunita Kumari

**Subject:** Animal Cell Culture

**Paper:**

S. No	Dates	Topics to be Covered
Week 1	03/08/2020 – 08/08/2020	History of development of cell cultures, the natural surroundings for animal cells,
Week 2	10/08/2020 – 14/08/2020	stimulating natural conditions for animal cells metabolic capabilities of animal cells,
Week 3	17/08/2020 – 22/08/2020	Biology of cultured cells : The culture environment, cell adhesion, proliferation, differentiation
Week 4	24/08/2020 – 29/08/2020	signaling, evolution of cell lines,
Week 5	31/08/2020- 05/09/2020	Equipments and materials for animal cell culture technology
Week 6	07/09/2020- 12/09/2020	Introduction to the balanced salt solutions and simple growth medium. Brief discussion on the chemical, physical and metabolic functions of different constituents of culture medium
Week 7	14/09/2020- 19/09/2020	Role of carbon dioxide. Role of serum and supplements. Serum & protein free defined media and their application
Week 8	21/09/2020- 26/09/2020	Animal cell culture Techniques: Dispersion and disruption of tissues; primary cultures, anchorage and non-anchorage dependent cells
Week 9	28/09/2020- 03/10/2020	secondary culture, transformed animal cells,
Week 10	05/10/2020- 10/10/2020	Established/continuous cell lines, commonly used animal cell lines, their origin and characteristics
Week 11	12/10/2020- 16/10/2020	Maintenance and growth kinetics of cells in culture, differentiation of cells
Week 12	19/10/2020- 24/10/2020	Measurement of growth and viability of cells in culture.
Week 13	27/10/2020- 30/10/2020	Cytotoxicity assays & their applications
Week 14	03/11/2020- 07/11/2020	Characterization of Cell lines and their authentication
Week 15	09/11/2020- 12/11/2020	Cell fusion and production of monoclonal antibodies.
Week 16	16/11/2020- 21/11/2020	Transformation and immortalization
Week 17	23/11/2020- 28/11/2020	cryopreservation , Bio-Safety & Bioethics

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**Name of the Teacher:** Dr. Sunita Kumari (On sharing basis..3 days /week)

**Subject:** Introduction to Genetic Engineering and Immunotechnology

S. No	Dates	Topics to be Covered
Week 1	03/08/2020 – 08/08/2020	Immunotechnology Basic Immunology: Types of immunity – innate, acquired,
Week 2	10/08/2020 – 14/08/2020	active and passive. Cells and tissues of immune system:
Week 3	17/08/2020 – 22/08/2020	Lymphoid cells, mononuclear cells.
Week 4	24/08/2020 – 29/08/2020	Lymphoid organs
Week 5	31/08/2020- 05/09/2020	Antigen:- Immunogenicity, chemical composition,
Week 6	07/09/2020- 12/09/2020	immunogen dosage, Haptens, adjuvants.
Week 7	14/09/2020- 19/09/2020	Antibody structure,
Week 8	21/09/2020- 26/09/2020	Antibody structure, function and types
Week 9	28/09/2020- 03/10/2020	Antibody diversity, Ig Domains.
Week 10	05/10/2020- 10/10/2020	Ag-Ab interactions
Week 11	12/10/2020- 16/10/2020	Cross reactions
Week 12	19/10/2020- 24/10/2020	Precipitation and agglutination.
Week 13	27/10/2020- 30/10/2020	Immunological Techniques: Immunodiffusion, Immunoelectrophoresis.
Week 14	03/11/2020- 07/11/2020	Major Histo-compatibility complex (MHC), MHC restriction, regulation
Week 15	09/11/2020- 12/11/2020	Antigen presentation and processing, antigen presenting cells,
Week 16	16/11/2020- 21/11/2020	Cell mediated subset of T-cells, Cytotoxic helper and suppressor cells.
Week 17	23/11/2020- 28/11/2020	Cell mediated and humoral immunity, antibody dependent cell mediated cytotoxicity, Natural killer cells.