**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Session Odd Semester**

**(2017-18)**

**Class:** B.Sc. (Hons.) 2nd year (3rd Semester)

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

**Subject:** Animal Cell Culture

**Period: Ist(3), IIIrd(6), Vth(5,6)**

**Room No** - 122, 111, 301

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| **S. No** | **Date From** | **Date Upto** | | **Topics to be covered** |
| Week 1 | July 22 & July 24 2017 | July 29, 2017 | | History of development of cell cultures, the natural surroundings for animal cells, |
| Week 2 | July 31 2017 | Aug 5, 2017 | | stimulating natural conditions for animal cells metabolic capabilities of animal cells, |
| Week 3 | Aug 7, 2017 | Aug 12, 2017 | | Biology of cultured cells : The culture environment, cell adhesion, proliferation, differentiation, signaling, evolution of cell lines, Equipments and materials for animal cell culture technology |
| Week 4 | Aug 14, 2017 | Aug 19, 2017 | | 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 5 | Aug 21, 2017 | Aug 26, 2017 | | 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 6 | Aug 28, 2017 | Sept 2, 2017 | | Role of carbon dioxide. Role of serum and supplements. Serum & protein free defined media and their application |
| Week 7 | Sept 4, 2017 | Sept 9, 2017 | | Animal cell culture Techniques: Dispersion and disruption of tissues; primary cultures,  anchorage and non-anchorage dependent cells |
| Week 8 | Sept 11, 2017 | Sept 16, 2017 | | secondary culture, transformed animal cells, |
| Week 9 | Sept 18, 2017 | Sept 23, 2017 | | Established/continuous cell lines, commonly used animal cell lines, their origin and  characteristics |
| Week 10 | Sept 25, 2017 | Sept 29, 2017 | | Maintenance and growth kinetics of cells in culture, differentiation of cells, |
| **Autumn Break (30 Sept 2017- 09 Oct 2017)**  **Mid Semester Exam (10 Oct 2017 – 17 Oct 2017)** | | | | |
| Week 11 | Oct 18, 2017 | | Oct 21, 2017 | Measurement of growth and viability of cells in culture. |
| Week 12 | Oct 23, 2017 | | Oct 28, 2017 | Cytotoxicity assays & their applications |
| Week 13 | Oct 30, 2017 | | Nov 4, 2017 | Characterization of Cell lines and their authentication |
| Week 14 | Nov 6, 2017 | | Nov 11, 2017 | Cell fusion and production of monoclonal antibodies. |
| Week 15 | Nov 13, 2017 | | Nov 18, 2017 | Transformation and immortalization |
| Week 16 | Nov 20, 2017 | | Nov 25, 2017 | cryopreservation. |
| Week 17 | Nov 27, 2017 | | Dec 1, 2017 | Bio-Safety & Bioethics |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Session Odd Semester**

**(2017-18)**

**Class:** B.Sc. (Hons.) 2nd year (3rd Semester)

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

**Subject:** Immunology-I

**Period: Vth(1-4)**

**Room No :** 301

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| **S. No** | **Date From** | **Date Upto** | | **Topics to be covered** |
| Week 1 | July 22 & July 24 2017 | July 29, 2017 | | **Introduction**  i) Overviews of immune system – Historical perspectives  ii) Innate and acquired immunity |
| Week 2 | July 31 2017 | Aug 5, 2017 | | Clonal nature of immune response.  **Cells of the immune system :** Hematopoiesis and differentiation |
| Week 3 | Aug 7, 2017 | Aug 12, 2017 | | Lymphocyte trafficking, B-lymphocytes, T-lymphocytes, macrophages, dendritic cells, Natural killer cells and lymphocyte activated killer cells, eosinophils, neutrophils & mast cells |
| Week 4 | Aug 14, 2017 | Aug 19, 2017 | | **Organs of the immune system :** Primary and secondary lymphoid organs, |
| Week 5 | Aug 21, 2017 | Aug 26, 2017 | | Systemic function of immune system  **Lymphocyte Trafficking**: Cell surface proteins, Cell Adhesion molecules ( Integrin,  Selectin, Cadherin family and Ig Superfamily). |
| Week 6 | Aug 28, 2017 | Sept 2, 2017 | | **Antigen** – Immunogenicity Vs. antigenicity, factors effecting immunogeneticity, nature  of immunogen, |
| Week 7 | Sept 4, 2017 | Sept 9, 2017 | | epitopes, heptans and antigenicity, pattern recognition receptors |
| Week 8 | Sept 11, 2017 | Sept 16, 2017 | | **Immunoglobulins:** Structure of antibody, antibody effector function, antibody classes  and biological activities, antigenic determinants on Immunoglobulins, |
| Week 9 | Sept 18, 2017 | Sept 23, 2017 | | Immunoglobulins superfamilies.  **Major histocompatibility complex:** General organization and inheritance |
| Week 10 | Sept 25, 2017 | Sept 29, 2017 | | cellular distribution, regulation of MHC expression and disease susceptibility |
| **Autumn Break (30 Sept 2017- 09 Oct 2017)**  **Mid Semester Exam (10 Oct 2017 – 17 Oct 2017)** | | | | |
| Week 11 | Oct 18, 2017 | | Oct 21, 2017 | antigen presentation, |
| Week 12 | Oct 23, 2017 | | Oct 28, 2017 | Production of Monoclonal Antibodies, applications of  polyclonal and monoclonal antibodies |
| Week 13 | Oct 30, 2017 | | Nov 4, 2017 | Strength of interaction, cross reactivity, antibody  affinity, avidity |
| Week 14 | Nov 6, 2017 | | Nov 11, 2017 | Antigen-antibody interactions as tools for research and diagnosis:  precipitation and agglutination reactions |
| Week 15 | Nov 13, 2017 | | Nov 18, 2017 | immunodiffusion, immunoelectrophoresis. |
| Week 16 | Nov 20, 2017 | | Nov 25, 2017 | immunoassays, Enzyme linked immunosorbent assay (ELISA),Radioimmunoassay (RIA), |
| Week 17 | Nov 27, 2017 | | Dec 1, 2017 | western blot, Immunofluorescence |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Session Even Semester(2017-18)**

**Class:** B.Sc. (Hons.) 2nd year (4th Semester)

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

**Subject:** Animal Biotechnology

**Period : IIIrd(6), IVth(4), Vth(5,6)**

**Room No : 111, 111, 301**

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| **S. No** | **Date From** | **Date Upto** | | **Topics to be covered** |
| Week 1 | Jan 13,2018 | Jan 14, 2018 | | Organotypic culture: Gas and nutrient exchange, structure integrity, growth, differentiation |
| Week 2 | Jan 15, 2018 | Jan 20, 2018 | | advantages and applications. Methods, advantages and applications of histotypic culture. |
| Week 3 | Jan 22, 2018 | Jan 27, 2018 | | Three dimensional culture and tissue engineering: Concept of tissue engineering |
| Week 4 | Jan 29, 2018 | Feb 3, 2018 | | components of tissue engineering, cells imaging in 3D construct. |
| Week 5 | Feb 5, 2018 | Feb 10, 2018 | | In vitro fertilization (IVF) in Humans and Embryo Transfer in Livestock. |
| Week 6 | Feb 12, 2018 | Feb 17, 2018 | | Cells as virus host/cell culture based vaccines, cells as protein factory/cell expression system |
| Week 7 | Feb 19, 2018 | Feb 24, 2018 | | cells as antigen presenter/personalized vaccine. Scaling up of the animal cell culture: different methods of scale up at laboratory level |
| Week 8 | Feb 26, 2018 | Mar 03, 2018 | | different methods of scale up at industrial level. |
| **First Week March (Mid Semester Exam)** | | | | |
| Week 9 | March 12,2018 | | March 17,2018 | Transgenic animals and their applications: Concept of transgenics, Methods of gene transfer, |
| Week 10 | March 19 ,2018 | | March 24, 2018 | selection of clone containing DNA insert and application of transgenic animals (Food, environment, recombinant proteins, drugs etc.). |
| Week 11 | March 26,2018 | | March 31, 2018 | application of transgenic animals (Food, environment, recombinant proteins, drugs etc.). |
| Week 12 | April 02,2018 | | April 07 , 2018 | Safety and ethical issues of transgenic animals. |
| Week 13 | April 09 ,2018 | | April 14 , 2018 | Production of various products of human use using animal cell culture: Antibiotics production |
| Week 14 | April 16,2018 | | April 21 , 2018 | Human Growth factors |
| Week 15 | April 23 ,2018 | | April 28, 2018 | Human Growth factors |
| Week 16 | April 30 ,2018 | | May 05, 2018 | Insulin and other Hormones |
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**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Session Even Semester(2017-18)**

**Class:** B.Sc. (Hons.) 2nd year (4th Semester)

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

**Subject:** Immunology-II **Period :IInd(3), Vth(1,2,3)**

**Room No : 122, , 301**

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| **S. No** | **Date From** | **Date Upto** | | **Topics to be covered** |
| Week 1 | Jan 13,2018 | Jan 14, 2018 | | B-Cell Activation and Proliferation, In Vivo Sites for Induction of Humoral Responses |
| Week 2 | Jan 15, 2018 | Jan 20, 2018 | | T-dependent and T-independent antigens. Genetic model, |
| Week 3 | Jan 22, 2018 | Jan 27, 2018 | | multigene organization, generation of antibody diversity |
| Week 4 | Jan 29, 2018 | Feb 3, 2018 | | T-Cell Receptors: Structure and Roles, T-Cell Receptor Complex. |
| Week 5 | Feb 5, 2018 | Feb 10, 2018 | | Thymic Selection of the T-Cell Repertoire, TH-Cell Activation |
| Week 6 | Feb 12, 2018 | Feb 17, 2018 | | T-Cell Differentiation, Cell Death and T-Cell populations, Peripheral-T-Cells. |
| Week 7 | Feb 19, 2018 | Feb 24, 2018 | | Complement system: Function, Components- Classic, Alternative, Mannose binding proteins, activation |
| Week 8 | Feb 26, 2018 | Mar 03, 2018 | | Regulation of the Complement System, Biological Consequences of Complement Activation. |
| **First Week March (Mid Semester Exam)** | | | | |
| Week 9 | March 12,2018 | | March 17,2018 | Hypersensitivity: Type I, Type II, Type III and Type IV Hypersensitivity reactions and their implications |
| Week 10 | March 19 ,2018 | | March 24, 2018 | Autoimmunity: Organ specific autoimmune diseases : Hashimoto’s Thyroditis, Insulindependent Diabetes Mellitus, Grave’s disease, Mysthenia Gravis. |
| Week 11 | March 26,2018 | | March 31, 2018 | Systemic Autoimmune Disease: Systemic lupus Erythematosuns (SLE). |
| Week 12 | April 02,2018 | | April 07 , 2018 | Transplantation immunology- Immunologic Basis of Graft Rejection, Clinical Manifestations of Graft Rejection |
| Week 13 | April 09 ,2018 | | April 14 , 2018 | General Immunosuppressive Therapy, Specific Immunosuppressive Therapy, Immune Tolerance to Allografts, Clinical Transplantation |
| Week 14 | April 16,2018 | | April 21 , 2018 | principles of vaccination, passive & active immunization, immunization programs |
| Week 15 | April 23 ,2018 | | April 28, 2018 | adjuvants, bacterial vaccines, viral vaccines |
| Week 16 | April 30 ,2018 | | May 05, 2018 | polysaccharide vaccines, DNA vaccines, recombinant vaccines ,vaccines to other infectious agents, tumor vaccines. |
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