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| Course Code IMMU-547 | Course Title Transplantation Immunology | ECTS Credits 7 |
| Department Life and Health Sciences | Semester Spring/Summer | Prerequisites IMMU-541 Cellular and Molecular Immunology |
| Type of Course Elective | Field Biomedical Sciences | Language of Instruction English |
| Level of Course 2 st Cycle | Year of Study 1 st | Lecturer Dr. Demoliou Catherine |
| Mode of Delivery Face-to-face | Work Placement N/A | Co-requisites None |

Objectives of the Course:

This course will provide a further understanding of the principles and issues in clinical transplantation. The aims of the course are to:

- Demonstrate the immune mechanisms underlying immune recognition of allograft
- Present the molecules and cells that are involved in the modulation of allograft rejection
- Emphasize the modern methods used for compatibility evaluations between donor, recipient and in sensitized patients
- Describe the strategies to prevent graft rejections
- Introduce other forms of transplantations (hematopoietic cell, xenogeneic) and the immunological issues associated with these.
- Review some of the advances in tolerance and xenotransplantation research.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Explain the function of the various cell and molecules underlying allograft rejection
- Account for the cells and molecular pathways that participate in organ rejection
- Identify donor tissue antigens and host cellular responses in hematopoietic cell transplantations
- Explain the scientific basis of techniques for HLA typing, detection of HLA antibodies and for monitoring T-cell responses
- Describe the genomics and proteomic-based methods for compatibility testing

- Discuss the use of immunosuppressive drugs to prevent organ rejection and the animal models used in transplantation research
- Account for the pathway of antigen presentation and chronic rejection
- Present the basis of tolerance induction strategies (i.e. use of regulatory T cells, mesenchymal stroma cells and lymphodepletions).
- Comment on the ethical issues underline organ transplantation

Course Contents:

- Alloreactivity; Antibodies in Transplantation
- HLA and Non-HLA Antibody; typing by PCR and DNA sequencing
- Cell Mediated Rejection;
- Transplantation Tolerance
- Transplantation of the Sensitized Patient:
- Histocompatibility Testing
- Chimerism Testing by Quantitative PCR; Gene-specific PCR Typing of Killer Cell Immunoglobulin-like Receptors (KIR)
- Complement-dependent Cytotoxicity Crossmatch;
- Tolerogenic Dendritic Cells and Induction of T Suppresson Cells in Transplant Recipients
- Stem cell biology and transplantation for hematologic malignancies
- Allogeneic stem cell transplantation
- Complications of transplantation (immune reconstitution/infections)
- Graft vs. host disease
- Immune modulation

Learning Activities and Teaching Methods:

Lectures; presentations and discussions of biotechnology/nonotechnology examples from scientific literature. Cooperative learning. Demonstration: Familiarization with data/graphs of experimental output; video presentations of technological applications and analytical instruments used.

Assessment Methods:

Assignments/Exercises; Oral presentations and written reports; Mid-term and Final Exam

Required Textbooks/Reading:

| Authors | Title | Publisher | Year | ISBN |
|--|--|------------------|--------------------|---|
| Fritz H. Bach, Hugh Auchincloss | Transplantation Immunology | Wiley-Liss | (1995) | ISBN-10: 0471304484 ISBN-13: 978- 0471304487 |
| Zachary, Andrea A., Leffell, Mary S. | Transplantation Immunology Series: Methods and Protocols | Humana Press; | 2nd ed. 2013 | ISBN-10: 1627034927 ISBN-13: 978- 1627034920 |

Recommended Textbooks/Reading:

| Authors | Title | Publisher | Year | ISBN |
|--|--|--|------------------------------|---|
| Laurence A. Turka, Kathryn J. Wood | Transplantation (Cold Spring Harbor Perspectives in Medicine) | Cold Spring Harbor Laboratory Press | 1 ed. (2013) | ISBN-10: 1936113880 ISBN-13: 978- 1936113880 |
| Bjarte G Solheim | HLA System in Clinical Transplantation: Basic Concepts and Importance | Wiley- Blackwell | 1 ed. (2009) | ISBN-10: 3527320849 ISBN-13: 978- 3527320844 |
| Robert J. Soiffer | Hematopoietic Stem Cell Transplantation | Humana Press; | 2nd ed. 2008 | ISBN-10: 1934115053 ISBN-13: 978- 1934115053 |
| Bruce Kaplan, Gilbert J. Burkhart, Fadi G. Lakkis | Immunotherapy in Transplantation: Principles and Practice | Wiley- Blackwell; | (2012) | ISBN-10: 1405182717 ISBN-13: 978- 1405182713 |
| Robert M. Veatch | Transplantation Ethics [Paperback] | Georgetown University Press; | Reprint edition (2002) | ISBN-10: 0878408126 ISBN-13: 978- 0878408122 |

