

**IMMUNOLOGY AND HISTOCOMPATIBILITY: Rotation Director: Juan Scornik, M.D., Professor**

**1. Description and Goals of the Rotation:** This is an 8-week rotation designed for the resident to understand the principles and clinical application of laboratory tests performed for immunology and transplantation. As appropriate to the individual case or consultation under review, the ethical, socioeconomic, medicolegal, and cost-containment issues are reviewed and discussed (ACGME competencies: #5: Professionalism; #6: Systems-Based Practice). As well, research design, statistics and critical review of the literature are discussed. By use of the literature, Medline, and textbooks, the resident is trained to become a lifelong learner (ACGME competency: #3: Practice-Based Learning).

**2. Reading:** The resident is assigned reading material (books, reviews or research papers) to cover most aspects of clinical laboratory immunology. The resident and laboratory director meet to discuss the content of the material assigned as often as necessary. Basic topics include role of the MHC in the induction of the immune response, antigen recognition by T cells and B cells, cellular events involved in the immune response, adhesion molecules and cytokines, T cell receptor and antibody diversity and basic aspects of alloimmunity and tolerance. Subjects of clinical application include HLA matching in organ transplantation, immunogenetic basis of bone marrow transplantation, immunodeficiencies and autoimmune diseases.

**3. Laboratory work:** Laboratory activities are emphasized mainly during the first two weeks of the rotation. The resident is expected to perform an HLA typing and become familiar with lymphocyte isolation, T and B cell isolation, and complement dependent cytotoxicity. Other laboratory activities in transplantation include alloantibody detection, flow cytometry crossmatch, enzyme immunoassay for anti-HLA antibodies, and DNA sequencing for bone marrow transplant patients. Immunodeficiencies are addressed by the use of flow cytometry and immunophenotyping (ACGME competency #2: Medical Knowledge). Note: Immunology is also taught in other rotations: SPEs, IFEs, hepatitis serologies, QIGs, C3, and C4 are assayed in clinical chemistry. ANAs and ANCAs are performed in microbiology but their significance and interpretation are part of this rotation.

**4. Duration of the rotation:** 8 weeks.

**5. Consults:** The most important activity occurs when all laboratory data on a patient are put together and interpreted according to the patient's clinical situation. This generates a consult or a laboratory director's report for HLA typing, family studies, disease associations, alloantibody problems, crossmatch results and transplant decisions, related and unrelated bone marrow transplant donor selection, lymphocyte immunophenotyping and characterization of immunodeficiencies. The resident is expected to review results on every patient and then each case is discussed in depth with the laboratory director during sign out. This activity takes place twice a day (ACGME competencies: #1: Pt.care; #2: Medical Knowledge; #4: Communication). The resident's performance during sign out is the most important guide of his/her progress and the basis of the evaluation.

**6. Teaching staff:** Juan Scornik, MD; Mai Ta, technical specialist

**7. i. Resident Supervision:** Reports are generated in concert with the attending faculty and signed out by the attending faculty. Calls are discussed and reviewed during call report (daily and at Monday noon CP conference).

**ii. Resident Evaluation:** The evaluation at the end of the rotation has three components. The first is an oral examination of the basic, clinical and laboratory aspects of immunology studied during the rotation. The second is an assessment of the resident performance in the form of brief comments. The third is an evaluation of the six competencies

required for residency training. The forms below, describing in detail these evaluations, are given to the resident, and discussed, the first day they report to the rotation.

Test volumes Jan-Dec 2003:

Immunophenotyping:	3224
HLA typing:	1291
HLA antibody:	2763
Crossmatch:	718
ANA titer	1737
ANA battery	2835
ANCA	406

Pathology Residency Program  
Evaluation for competence in Immunology

Resident name: \_\_\_\_\_ Dates of rotation: \_\_\_\_\_

Faculty:                                      Juan C. Scornik, M.D.                                      Date of evaluation:

The questions, given as an oral examination, are weighted as a maximum value (Max) when the answer is satisfactory in all respects, or a fraction of it when the answer is not completely satisfactory. An answer not completely satisfactory implies a significant deficiency in the corresponding subject.

<u>Basic Immunology Objectives</u>	Max	Response
Natural and adaptive immunity	2	
Organization of secondary lymphoid organs	2	
MHC structure and function	2	
MHC genes, polymorphism	2	
Ig structure and function	2	
TCR structure and function	2	
Ig and TCR diversity	2	
Antigen Presenting Cells	2	
Direct and indirect alloimmunization	2	
Co-stimulatory and adhesion molecules	2	
Cytokines, TH1 and TH2 cells	2	
Lymphocyte stimulation and subset markers	2	
Central tolerance (thymus)	2	
Peripheral tolerance	2	
Overview of the immune response	5	
 <u>Clinical Pathology Objectives</u>		
HLA matching in organ transplantation	3	
HLA matching in stem cell transplantation	2	
Induction of HLA antibodies	2	
Prefomed antibodies in renal transplants	2	
Prefomed antibodies in non-renal transplants	2	
HLA and disease associations	2	
Immunodeficiencies	2	
Antinuclear antibodies	4	
Anti-neutrophil cytoplasmic antibodies	2	
 <u>Technical Objectives</u>		
Serological HLA typing	2	
Molecular HLA typing	2	

HLA antibodies: screening and crossmatch	2	
Mitogen assays	2	
Tests for engraftment	2	
Immunophenotyping	2	
Totals	66	%

**Core Curriculum for Immunology**  
**Juan Scornik, M.D.**

Basic Immunology Objectives	Faculty
Natural and adaptive immunity	Scornik
Organization of secondary lymphoid organs	Braylan
MHC structure and function	Scornik
MHC genes, polymorphism	Scornik
Ig structure and function	Scornik
TCR structure and function	Scornik
Ig and TCR diversity	Scornik
Antigen Presenting Cells	Clare-Salzler
Direct and indirect alloimmunization	Scornik
Co-stimulatory and adhesion molecules	Scornik
Cytokines, TH1 and TH2 cells	Scornik
Lymphocyte stimulation and subset markers	Scornik
Central tolerance (thymus)	Scornik
Peripheral tolerance	Scornik
Targets of immunosuppressive agents	Scornik

Clinical Pathology Objectives

HLA matching in organ transplantation	Scornik
HLA matching in stem cell transplantation	Scornik
Induction of HLA antibodies	Scornik
Preformed antibodies in renal transplants	Scornik
Preformed antibodies in non-renal transplants	Scornik
Autoimmunity	Scornik
Immunology of IDDM	Winter
HLA and disease associations	Scornik
Immunodeficiencies	Skoda-Smith
Allergy and hypersensitivity	TBA

Technical Objectives

Serological HLA typing	Scornik
Molecular HLA typing	Scornik
HLA antibodies: screening and crossmatch	Scornik
Mitogen assays	Scornik
Tests for engraftment	Scornik
Immunophenotyping	Scornik
Antinuclear antibodies	Scornik
Anti-neutrophil cytoplasmic antibodies	Scornik
Other autoantibodies	Scornik
Serum proteins. SPE, UPE, IFE	Winter
IgE, RAST	TBA