DEPARTMENT OF PATHOLOGY

Molecular Pathology and Histocompatibility

Course Number	CLNS 950S		**Duration**	4 weeks
Credit Type	☒ Clinical Elective	☐ Non-Clinical Elective	☐ Sub-Internship	☐ ICU
Available Blocks	☒ 1 ☒ 2 ☒ 3 ☒ 4 ☒ 5 ☒ 6 ☒ 7 ☒ 8 ☐ 9 ☒ 10 ☒ 11 ☐ 12 ☒ 13 ☒ 14			
# of Students per Rotation	☐ One	☒ Two	☐ Other:	
Faculty Evaluator(s)	Molecular Path:	Devon Chabot-Richards, MD	Mohammad Vasef, MD	David Czuchlewski, MD
Faculty Evaluator(s)	Histocompatibility:	Barbara J. Masten, PhD		
Prerequisites	☒ All Phase II Clerkships	☐ Department specific clerkship/rotation:	☐ Other:	
Visiting Students Accepted	☐ Domestic MD	☐ Domestic DO	☐ International	☒ None
Accept Students Off-Cycle	☐ Yes – with department permission	☒ No		
Add/Drop Policy	ADD: 30 days	DROP: 30 days	Other:	
Clerkship Contact(s)	Devon Chabot-Richards, MD	dchabot-richards@salud.unm.edu		
	Barbara J. Masten, PhD	bmasten@salud.unm.edu		

Goals and Unique Aspects:

* Note: Students taking this rotation will spend 2 weeks on Molecular Pathology and 2 weeks on Histocompatibility. *

The Molecular Pathology course will introduce students to the role of molecular testing in patient care. Students will be exposed to a variety of methods of molecular testing in areas including solid tumor and hematologic oncology and inherited diseases. They will learn the role of the molecular pathologist in test utilization, interpretation, and reporting. This rotation is appropriate for students interested in pathology as well as other specialties that order molecular tests and apply them to patient care such as hematology and oncology and primary care specialties, among others.

The rotation in Histocompatibility (HLA) will equip the student with an overview of the role of this laboratory and the testing it performs, in the workup of the various types of patients and clients it serves. The student will learn the essential administrative, clinical, and technical aspects of solid organ and bone marrow transplantation, disease susceptibility testing, and transfusion support for platelet refractory patients, along with engraftment monitoring for bone marrow transplantation. The student will become familiar with quality assurance, quality control, quality improvement, and ethical issues as they relate to Histocompatibility. The student will become familiar with the various regulatory agencies and requirements that impact on this unit of the laboratory.

Objectives:

Molecular:

Define assay performance characteristics including clinical and analytic sensitivity, accuracy, precision, reportable range of test results, limitations, and reference values where appropriate.

Attempt to choose applicable molecular tests in different patient scenarios.

Determine how molecular test results affect patient care in different patient scenarios.

Discriminate between germline and somatic targets of testing.

Discuss the ethical considerations in molecular testing including informed consent, incidental and secondary findings, and the role of genetic counselors in navigating these areas.

HLA:

1.Explain the HLA nomenclature.

2.Describe the organization and polymorphism of the human major histocompatibility complex (MHC), including HLA class I, II, and III genes.

3.Describe the basic function, protein structure, and cell expression of HLA class I and class II gene products.

4.Explain the levels of HLA matching required for solid organ and hematopoietic stem cell transplantation.

5.Given HLA typings for a donor and recipient, provide an interpretation of matching for graft versus host (GVH) and host verses graft (HVG).
6.Describe the clinical presentations and basic mechanisms of solid organ rejection.
7.Explain serology-based and DNA-based HLA typing techniques..
8.Describe the testing platforms used to detect the presence of HLA antibody in a patient's serum.
9.Given a pre-transplant serum sample, determine which HLA specificities should be: (a) entered into UNOS as avoids, (b) monitored for crossmatch reactivity, and (c) expected to give a negative crossmatch.
10.Given a post-transplant serum sample, determine if the recipient may be at risk for antibody-mediated rejection.
11.Given an HLA typing, provide a risk interpretation for HLA-related disease susceptibility.
12.Demonstrate familiarity with standards for histocompatibility and reporting set forth by United Network for Organ Sharing (UNOS), American Society of Histocompatibility and Immunogenetics (ASHI), National Marrow Donor Program (NMDP), and the College of American Pathologists (CAP).
13.Describe the HLA testing algorithm and interpret test results for risk of rejection for solid organ transplantation, including living and deceased donor workups.
14.Describe the HLA test algorithm used for hematopoietic stem cell/bone marrow transplantation, including related and unrelated donors workups; and determine risk of GVHD and HVGD.
15.Interpret chimerism testing results to determine success of engraftment/disease relapse after an allogeneic HSC transplant.
16.Explain the algorithm used to evaluate patients that are refractory to platelet transfusions.
17.Briefly explain quality control, quality assurance, and quality improvement initiatives for histocompatibility laboratory services.
18.Describe the basic operation of a regional organ procurement organization (OPO) and its relationship with the histocompatibility laboratory.
19.Describe some of the major ethical issues in tissue and organ transplantation (e.g., confidentiality, informed consent, living-related and –unrelated organ donation, etc.).

Responsibilities:
Students will shadow molecular technologists in the laboratory. They will read about the diseases and testing they observe during the rotation. They will work with the pathology residents and fellows to interpret test results. They will attend signout with the molecular directors. They will attend appropriate meetings as determined by the molecular directors.
The student is expected to: (1) complete assigned readings and assignments, (2) interact with HLA directors, HLA supervisor, and HLA bench techs, (3) attend scheduled meetings with clients, (4) participate in scheduled CE offerings, (5) using a provided checklist, tract completion of HLA learning activites, and (5) notify director of unscheduled absence.

Supervision and Teaching:
The molecular director on service will oversee the student with feedback from the molecular technologists and supervisor as well as pathology residents and fellows.
The HLA Director will oversee, guide, and crituiqe the student, incorportating feedback from the HLA Supervisor and bench techs.
The student will inteact with (a) the HLA Director during case sign-outs and didactics, (b) the HLA Supervisor during case and topic discussions, and (c) bench techs during assay set-up, data analysis, and resulting.

Evaluation:
The molecular director will assess the student based on their interactions during sign out with input from the pathology residents and fellows and molecular technologists. Grading will be based on completion of reading assignments and case discussions. Assessment entails oral case discussions, written submission of independent case studies, and multiple-choice quizzes presented and assessed by the HLA Director.

Additional Information:
The HLA Laboratory Director will meet with the medical student at the beginning of the rotation to discuss objectives and provide a general orientation to the section. Periodically the Laboratory Director will meet with the student to discuss the student's progress toward meeting objectives, and will make suggestions for improvement if problems are noted.