

UMC/TTUHSC HEMATOPATHOLOGY ROTATION

Responsible Person: Dr. Safia Labib

REQUIRED rotation

This is a onetime rotation and is not planned by PGY level.

Objective

The objective of this rotation is to teach fellows all aspects of laboratory medicine as it impacts hematology/oncology.

Goals

- The goal of this rotation is to teach fellows skills in laboratory investigation, apheresis, and blood product transfusions. Specifically, fellows will learn how to collect and measure complete blood counts, examine blood smears, and perform and evaluate coagulation tests, including partial thromboplastin time, prothrombin time and platelet aggregation.
- Another goal is to teach fellows how to perform and evaluate bone marrow examinations, including aspiration and biopsy procedures. The fellows will learn how to prepare, stain, examine and interpret blood smears, bone marrow aspirates, and touch preparations. The fellow should be familiar with myeloperoxidase stains, dual esterase stain, the Kleihauer-Bethke test, the sickle dex, LAP score, and special cytochemical stains available for hematological diagnosis.
- Fellows will learn to prepare, stain, examine and interpret lymph node and spleen tissue for diagnosis of lymphoid disorders.
- Fellows will become proficient in interpreting immunophenotype of hematolymphoid diseases by flow cytometry. They will also learn to conduct and interpret immunohistochemistry analyses, karyotype analyses, and nucleic acid analyses by molecular diagnostic methods including Southern blot analysis, PCR and DNA sequencing.
- Fellows will learn indications and performance of blood typing tests for blood transfusions. They will learn indications for blood and blood component transfusion, blood and blood component collection, storage, cross matching and utilization. They will learn to detect and analyze adverse reactions. They will also learn apheresis procedures for collection of blood products including peripheral blood stem cells and therapeutic apheresis. They will also learn how to test for cryoglobulins and cold agglutinins and their clinical significance.

Activities:

- Fellows will rotate in the hematopathology flow cytometry lab to learn diagnostic approaches to leukemias and lymphomas. They will become familiar with flow cytometric techniques using different antibodies, immunohistochemistry, electrophoreses, molecular diagnostics and other methods to obtain diagnoses. Fellows will also learn about specialized myeloma procedures, high resolution DNA analysis and cIg/DNA studies.

- Fellows will rotate in the blood bank to familiarize themselves with standard blood banking practice, with a special focus on common blood banking problems relevant to the Hematologist-Oncologist.
- Fellows will attend all meetings in the hematopathology division (see below). They will report to the on-call Clinical Pathology resident to discuss problems handled the previous night: specifically hematology/blood bank/therapeutic apheresis problems. Attendance is required for all clinical Pathology attendings and residents. The meeting consists of a practical discussion of Hematology/Blood banking/therapeutic apheresis problems, and their resolutions.
- **Meeting schedule:** per hematopathology attending.
- Fellows will attend all bone marrow sign-out sessions. Fellows should check in with the current Hematology resident assigned to bone marrow sign-out regarding interesting cases of the day. Biopsy slides from the previous day marrow procedures are available for review by 8:30 AM. The fellow should check with the Hematology resident to identify interesting cases and when the Hemepath attending will come in for sign-out.
- Pathology faculty members host a series of didactic lectures in hematopathology. Hematology/Oncology fellows are welcome to attend.

Projects:

- Fellows will present a discussion of diagnostic work-ups of all patients presented at Hematopathology conferences.

Reading Assignments

See references below [1-16].

Competencies to be Addressed:

- Knowledge - fellows will learn indications, methods, and shortcomings of each of the procedures and technologies mentioned above.
- Technical skills - fellows will learn how to do procedures mentioned above.
- Professionalism - fellows will learn how to communicate results with ordering physicians.

Evaluations:

- Global attending evaluation
- Formal presentations on case reviews Fridays at 12:15 p.m. heme-path conferences, to be evaluated by members of the audience and to be placed in portfolio upon completion of conference.

- Semi-annual examination will have questions related to information obtained during this rotation.

References:

1. Sen, F., F. Vega, and L.J. Medeiros, *Molecular genetic methods in the diagnosis of hematologic neoplasms*. Semin Diagn Pathol, 2002. **19**(2): p. 72-93.
2. Swerdlow, S.H. and M.E. Williams, *From centrocytic to mantle cell lymphoma: a clinicopathologic and molecular review of 3 decades*. Hum Pathol, 2002. **33**(1): p. 7-20.
3. Chan, J.K., *The new World Health Organization classification of lymphomas: the past, the present and the future*. Hematol Oncol, 2001. **19**(4): p. 129-50.
4. Huh, Y.O. and S. Ibrahim, *Immunophenotypes in adult acute lymphocytic leukemia. Role of flow cytometry in diagnosis and monitoring of disease*. Hematol Oncol Clin North Am, 2000. **14**(6): p. 1251-65.
5. Jancar, J., *Progress in the classification of hematological neoplasms. From REAL to WHO concept*. Adv Clin Path, 2000. **4**(2): p. 87-97.
6. Harris, N.L., et al., *Lymphoma classification--from controversy to consensus: the R.E.A.L. and WHO Classification of lymphoid neoplasms*. Ann Oncol, 2000. **11 Suppl 1**: p. 3-10.
7. Bagg, A. and B.V. Kallakury, *Molecular pathology of leukemia and lymphoma*. Am J Clin Pathol, 1999. **112**(1 Suppl 1): p. S76-92.
8. Sambade, C., J.F. Sallstrom, and C. Sundstrom, *Molecular pathology in the diagnosis of hematologic neoplasia. Review article*. Apmis, 1997. **105**(12): p. 895-903.
9. Bouroncle, B.A., *Thirty-five years in the progress of hairy cell leukemia*. Leuk Lymphoma, 1994. **14 Suppl 1**: p. 1-12.
10. Duque, R.E., et al., *Consensus review of the clinical utility of DNA flow cytometry in neoplastic hematopathology*. Cytometry, 1993. **14**(5): p. 492-6.
11. Kagan, J., *Molecular biology of chromosomal aberrations in leukemia/lymphoma*. Hematol Pathol, 1993. **7**(3): p. 159-201.
12. Jaffe, E.S., et al., *An overview of the classification of non-Hodgkin's lymphomas: an integration of morphological and phenotypical concepts*. Cancer Res, 1992. **52**(19 Suppl): p. 5447s-5452s.
13. Hirsch-Ginsberg, C. and E. deLeon, *Molecular genetics diagnostic applications in oncology*. Clin Lab Sci, 1991. **4**(5): p. 284-6.
14. Harrington, D.S., *Molecular gene rearrangement analysis in hematopathology*. Am J Clin Pathol, 1990. **93**(4 Suppl 1): p. S38-43.
15. Strickler, J.G. and C.M. Copenhaver, *In situ hybridization in hematopathology*. Am J Clin Pathol, 1990. **93**(4 Suppl 1): p. S44-8.
16. Jaffe, E.S., *Immune markers in the diagnosis of malignant lymphomas*. J Virol Methods, 1988. **21**(1-4): p. 265-73.