# Molecular Diagnostics and Cytogenetics Course

UNC Department of Pathology and Laboratory Medicine
February 2013

Goal: To instill expertise in molecular diagnostics and cytogenetics so that our residents and fellows become competent clinical consultants on the use of genetic technology in a wide variety of clinical settings. Trainees develop technical, clinical, communication, management, and judgment skills. A fundamental understanding of genetic technologies prepares them to comprehend the medical literature now and as new genetic test procedures are introduced in future years. Training is provided in a structured environment via didactic seminars, laboratory procedures, preparing clinical cases for sign out under the supervision of expert faculty, and interaction with clinicians, counselors, and laboratory scientists. A project is done on a topic of their choosing.

Objectives:

1. Gain a working knowledge of molecular technologies including Southern blot, *in situ* hybridization, polymerase chain reaction, arrays, protein truncation test, melt curve analysis, and sequencing. Learn about clinical applications in patients with cancer, inherited disease, and infectious disease, and about applications in HLA typing, parentage, and forensics.
2. Gain a working knowledge of cytogenetics including terminology, karyotypes, and FISH. Learn clinical applications of cytogenetics such as prenatal diagnosis, identification of congenital abnormalities, and diagnosis and monitoring of malignancy.
3. Interpret molecular and cytogenetic data from clinical cases and compose diagnostic reports, in correlation with clinical, morphologic, and immunophenotypic findings.
4. Discuss quality assurance, assay validation, ethics, regulatory issues, professionalism, and lab administration.

Resident Duties and Responsibilities: The resident attends didactic sessions, delivers case-based and scholarly presentations, observes testing, reads articles, interprets results, and prepares cases for sign-out. Recommended texts are Tubbs RR, *Cell and Tissue Based Molecular Pathology* ($159, 2008); Leonard DGB: *Essentials of Molecular Pathology* ($79, 2007) or *Molecular Pathology in Clinical Practice* ($189, 2007); Bruns DE: *Fundamentals of Molecular Diagnostics* ($60, 2007); Coleman WB and Tsongalis GJ: *Molecular Pathology* ($99, 2009), or *Essential Concepts in Molecular Pathology* ($63, 2010).

Method of Resident Supervision and Evaluation: After participating in scheduled laboratory and didactic sessions overseen by faculty and staff, the resident delivers three oral case-based presentations, and a fourth end-of-rotation presentation on a topic of their choice. The course director oversees all training activities and evaluates the performance of each trainee.

Course Director: Margaret L. Gulley, MD margaret_gulley@med.unc.edu
Faculty: Booker, Chao, Civalier, Coleman, Eron, Farber, Friedman, Funkhouser, Gilligan, Gulley, Hammett-Stabler, Hu, Johnson, Kaiser-Rogers, Keelean-Fuller, Lai-Goldman, Miller, Moll, Muenzer, Nelson, Perou, Powell, Rao, Schmitz, Shaheen, Skrzynia, Socinski, Thorne, Trembath, Weck, Zariwala, fellows, technologists, and others.

Registration: Anatomic and Clinical Pathology Residents at UNC are required to complete the course. Training occurs at UNC Hospitals from ~9-5pm weekdays in February 2011. Participants from other departments / institutions may attend at a cost of $1200 each. The deadline for registering is Jan 10, 2013. (The next course offering will probably be 2015.) For information contact Dr. Gulley at margaret_gulley@med.unc.edu.