Goal: To instill expertise in molecular diagnostics and cytogenetics so that our residents and fellows become competent clinical consultants on 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 workshops under the supervision of expert faculty, and interaction with clinicians, counselors, and laboratory scientists. A project is completed on a topic of choice.

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 (Sanger, NextGen, pyrosequencing). Learn about clinical applications in patients with cancer, heritable disease, and infectious disease, and about applications in HLA typing, parentage, forensics, and pharmacogenetics.
2. Gain a working knowledge of cytogenetics including terminology and methods (karyotypes, FISH, and SNP chip arrays). Learn clinical applications in prenatal diagnosis, congenital disorders, and cancer diagnosis and monitoring.
3. Interpret molecular and cytogenetic data in correlation with clinical, morphologic, and immunophenotypic findings.
4. Discuss quality assurance, assay validation, ethics, regulatory issues, and lab administration.

Resident Duties and Responsibilities: The resident attends didactic sessions, delivers case-based and scholarly presentations, observes testing, interprets results, reads articles, and prepares cases for sign-out. Optional texts are-
- Coleman W, Tsongalis G: Diagnostic Molecular Pathology, 1e, Elsevier ($180, 2016)
- Netto GJ, Schrijver I: Genomic Applications in Pathology, ($ 239, 2015).
- Leonard D: Molecular Pathology in Clinical Practice, 2e, Springer ($99, 2016)
- Vasef MA, Auerbach A: Diagnostic Pathology: Molecular Oncology, 1e, Springer ($315, 2015).

Method of Resident Supervision and Evaluation: Participation is monitored 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 training and evaluates performance with input from colleagues.

Course Director: Margaret L. Gulley, MD margaret_gulley@med.unc.edu
Faculty: Booker, Calikoglu, Chao, Civalier, Coleman, Duncan, Eberhard, Evans, Farber, Friedman, Funkhouser, Gulley, Hayes, Kaiser-Rogers, Kleeian-Fuller, King, Lai-Goldman, Miller, Moll, Montgomery, Nelson, Perou, Powell, Schmitz, Schwartz, Shaheen, Skrzynia, Strande, Thorne, Trembath, Weck, Wohl, fellows, technologists, and others.

Registration: Training occurs at UNC Hospitals from ~9-5pm weekdays in August 2017. The course is a requirement for Anatomic and Clinical Pathology Residents and some Fellows at UNC. Participants from other departments / institutions may attend at a cost of $1200 each. The deadline for registering is July 20, 2017.

The next iteration of this Course will be held in 2019.

For information contact Dr. Gulley at margaret_gulley@med.unc.edu.