

CYTOGENETICS / FISH LABORATORY ROTATION

Supervisor:

Susan Olson, PhD

Faculty:

Susan Olson, PhD; Stephen Moore, PhD

Location:

Marquam Plaza, 3rd Floor Cytogenetics Lab

Duration:

1 month

GOALS AND OBJECTIVES:

Patient Care:

Participate in multiple working sessions with the lab director regarding clinical interpretation of karyotypes & FISH probes and generation of interpretive reports.

Medical Knowledge

Understand the process of obtaining human metaphase spreads, including cell cycle considerations and synchronization techniques, and of staining, microscopy, electronic image capturing, karyotyping, and appropriate interpretation of the chromosomes obtained.

Understand the significance of chromosome aneuploidy and structural alterations, such as deletions, duplications, inversions and translocations, in human genetics and medicine.

Observe the culture processes, including lymphocyte, bone marrow, prenatal (chorionic villi and amniotic fluid), and skin, and including special culture processes when available.

Observe or participate in harvesting the cultured cells and understand differences in the process between the various cell types.

Participate in or observe slide making and drying and understand modifications necessary to account for changes in environment.

Observe or participate in trypsin G-banding and understand the indications and interpretation.

Understand other special staining and banding techniques, and for what instances they might be appropriate or informative.

Participate in the molecular techniques widely used in the lab, particularly fluorescent in-situ hybridization (FISH), including choice of appropriate probes for different medical indications; participation will include probe selection, hybridization, scoring cells under fluorescent microscopy, image capturing, and interpretation of results.

CYTOGENETICS / FISH LABORATORY ROTATION

Appreciate how new techniques (especially FISH) have added to our knowledge of chromosomal abnormalities.

Interpersonal & Communication Skills:

The resident must be able to demonstrate interpersonal and communication skills that result in effective information exchange with patients and laboratory and clinical colleagues. This is learned by:

- a. interpersonal working relationships with faculty.
- b. interpersonal working relationships with laboratory staff.
- c. interpersonal working relationships with other residents and fellows.
- d. communicating lab-derived technical and clinical results to referring clinicians.
- e. sharing knowledge with others.
- f. explaining diagnoses, procedures, expected results, and costs associated with cytogenetic studies to patients and clinical and laboratory colleagues.

Practice-based Learning and Improvement

The resident must be able to investigate and evaluate his/her patient care practices, appraise and assimilate scientific evidence, and improve his/her patient care practices by:

- a. reviewing evaluations from clinical and laboratory rotations.
- b. successfully completing required didactic coursework.
- c. analyzing individual lab cases for sign-out with attending pathologists/geneticists.
- d. preparing case studies and reviews of the associated clinical and basic science literature for presentations to faculty mentors and/or at departmental seminars.
- e. understanding the process of specimen acquisition, handling, processing, and labeling, and how to effectively troubleshoot these pre-analytical issues.
- f. understanding and contributing to effective quality assurance/quality improvement activities.
- g. effectively consulting with clinicians regarding pre-analytical and quality assurance/quality improvement issues.
- h. participating in the teaching of medical and graduate students, other residents and fellows, and faculty, by presenting appropriate information at department conferences and formal and informal case presentations.

Professionalism

The resident must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diverse patient populations. In particular, the resident will:

- a. report promptly and reliably to assigned duties.
- b. interact with patients, colleagues and peers respectfully.
- c. demonstrate sensitivity to diverse cultures, ages, genders, and abilities.
- d. respond to questions, requests, follow-ups and other professional communication in a timely manner.
- e. adhere to departmental and institutional policies and procedures.
- f. respect patient confidentiality, informed consent, and ethical business practices.

Systems-Based Practice

The resident must demonstrate an awareness of and responsiveness to the larger context and system of care, and the ability to effectively call on system resources to provide care that is of optimum value. Residents are expected to:

- a. make effective use of hospital and laboratory information systems to efficiently collect, organize, and report patient-specific information.

CYTOGENETICS / FISH LABORATORY ROTATION

- b. make effective use of other resources to obtain information, including textbooks, manuals and the internet.
- c. understand the economic ramifications of diagnostic testing decisions by practicing cost-effective medicine.
- d. work with the lab directors, hospital managers, and clinicians to assess clinical lab testing needs, and deliver cost-effective, patient-centered methods for meeting these needs.

EVALUATION

Patient care and medical knowledge are evaluated by direct observation and standardized written exams (RISE), respectively. Portfolios that emphasize the work of trainees and 360 evaluations are used to evaluate the remaining competencies.