HGEN 6550: Laboratory Fieldwork Course

Credit Hours: 2.0

Contact Information

Name	Position	Phone	Email
Faculty TBD			UUGPGC@utah.edu

Course Information

Brief Description of Course

Students will learn about testing methodologies used in various genetic laboratories including enzyme assays, fluorescence monitoring, capillary electrophoresis, polymerase chain reaction (PCR), Sanger sequencing, multiplex ligation dependent probe amplification (MLPA), next generation sequencing, genomic microarray, chromosome analysis, interphase and metaphase FISH, cell-free DNA prenatal screening and maternal serum screening, and newborn screening. They will participate in complex clinical test interpretations in the molecular genetics/genomics, biochemical genetics, cytogenetics, and manual endocrinology laboratories. Students develop an understanding of and appreciation for the role of the genetic counselor in the clinical laboratory.

Course Objectives

At the conclusion of this course students will be able to:

1. Apply principles of cytogenetic, biochemical / metabolic genetics, and molecular / genomics in detail using case examples.
2. Utilize cases to describe biochemical / metabolic genetics, cytogenetics, molecular / genomics, and maternal serum screening/cfDNA screening testing methodologies, including applications/limitations and clinical appropriateness.
3. Summarize the roles of genetic counselors in a clinical testing laboratory including case management, order review, addressing problems with orders and samples, interpretation and reporting, and communicating results to client laboratories and healthcare providers.
4. Identify genetic counseling principles applied in the laboratory setting, including (but not limited to) setting an agenda, determining agenda of the client, speaking at the level of the client, active listening, reflective listening, and partnering to find solutions.
5. Detail test choice, interpretation, and reporting based on the sample type, indication for testing, and the sensitivity / specificity of the test methodology.
6. Classify several variants by integrating information from a variety of computational databases, medical literature and on-line and in house databases.
7. Explain laboratory requirements for both postnatal and prenatal constitutional cytogenetic testing including culture problems, caveats regarding maternal cell contamination, and how and why certain samples are prioritized in the laboratory.
8. Perform Bayesian analysis calculations to determine patient risks for cystic fibrosis or other disorders.
9. Plan and execute a molecular case presentation integrating knowledge of clinical findings, testing methodology, clinical and analytical sensitivity and specificity, result interpretation and genetic counseling issues.
10. Discuss the utility of different biochemical tests and the importance of specimen type and proper sample handling
11. Explain how different biochemical tests provide complimentary information to deliver a diagnosis
12. Describe which biochemical tests are appropriate to address different clinical questions

The ACGC Practice-Based Competencies Addressed in this course:

- Genetics and Genomics Expertise: 1; 1.a, 1.b., 1.c.
- Risk Assessment: 2; 2.c, 2.d.

- Counseling: 3; 3.a, 3.b, 3.d.
- Communication: 4; 4.a, 4.b, 4.c.
- Healthcare Systems: 6; 6.a, 6.b., 6.c.
- Professional Identity: 7; 7.a, 7.b, 7.c, 7.d.

Course Format & Schedule

Timeline
Three week full time rotation, held in person 8 hours per day for 3 weeks.

Educational and Instructional Modalities
Students participate in workshops and analyze cases including a presentation. Most of the work is active, case-based and collaborative.

Role of the Student in this Course
Students will be expected to engage in a variety of learning activities including reading, viewing videos, sharing with peers, role plays, case studies, and creating presentations.

Required Textbooks/Readings
- Course handbooks, recommended publications, slide presentations, and videos will be accessible to students in Canvas.

Assessment & Grading
Evaluation Methods
This course is graded as pass/fail.

Grading System

Student will be evaluated as exceeds, meets, or below expectations based on their knowledge base (genetics and medicine, critical thinking, correlation of laboratory results with clinical status), professional demeanor and interpersonal skills, and quality of work (case presentations, assignments, participation in workshops)

Standard Policies

The Americans with Disabilities Act.
The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 801-581-5020. CDS will work with you and the instructor to make arrangements for accommodation. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

Addressing Sexual Misconduct.
Title IX makes it clear that violence and harassment based on sex and gender (which Includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801- 585-2677(COPS).

Campus Safety.
The University of Utah values the safety of all campus community members. To report suspicious activity, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Alternate Name and/or Personal Pronoun
Class rosters are provided to the instructor with the student's legal name as well as 'Preferred' first name (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, we will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise us of any name or pronoun changes (and please update CIS) so we can help create a learning environment in which you, your name, and your pronoun will be respected.

Current COVID-19 Campus Guidelines
COVID-19 Guidelines change rapidly. Please access the most current information COVID-19 Central @ The U. coronavirus.utah.edu