

CTSC 6160

Case Studies in Precision Medicine – Solving Medical Odysseys

Faculty: Eric Klee, PhD and Lisa Schimmenti, MD

Credits: 1

Quarters: Spring

Prerequisites: CTSC 5020, CORE 6510

Overview

In this course, students will be provided with clinical data from an actual medical odyssey patient from the Mayo Clinic. The cases have been previously solved through the Center for Individualized Medicine, Genomic Odyssey Board and identified to have pathogenic sequence variants that are consistent with their medical phenotype. Students will be given raw whole exome sequencing data and the medical phenotype of the patient only. The results of the sequencing data will not be revealed to the student who will then “solve” the medical mystery and demonstrate an understanding of how arriving at a diagnosis for a patient is an example of personalized medicine and will improve the medical management of the patient.

In order to “solve” their assigned medical mystery, students will be lead stepwise through a series of genomic bioinformatics skills over the course of 11 weeks. Students will take the raw sequencing data from the patient and in some situations, first degree relatives, analyze the data and by the end of the course, have sufficient bioinformatic sophistication to be able to solve their case.

Objectives

At the completion of this course, students will be able to:

- Review and understand medical summaries for “unsolved” medical odyssey patients
- Identify and interpret the medical outcomes of identifying a pathogenic sequencing variant that leads to a diagnosis in the context of personalized medicine
- Ability to access and utilize human genetic disease databases to interpret genetic variants
- Create and execute a systematic and thorough analysis plan whole exome data for an individual patient
- Integrate multiple data sources and synthesize an explanation of the genetic underpinnings of the odyssey patient(s)
- Demonstrate the ability to work in teams and use team based science principals in the analysis of sequence data

For specific dates and times this course is provided, please see the [quarterly detailed course schedule](#).

Evaluation

This course will evaluate students on class attendance and participation, attending the Medical Odyssey Board and completing a medical mystery presentation.

Students will be expected to spend approximately two to three hours per week on content from this 1-credit course.

Additional online modules related to this topic are available through the [Continuous Professional Development website](#).

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