

Overview

This is a non-traditional course designed to engage you in projects that relate to personalized medicine, particularly incorporating consideration of the impact of genome analysis. Rather than absorbing lecture material, the emphasis will be on self-directed learning and realization of deliverable projects in small teams working throughout the semester. We will start with a survey of predictive health (past, present and future), and lay down the essentials of genetic risk evaluation. Then each week a pair of students will be responsible for a presentation on the assigned topic and leading discussion, and we will work together in class to make constant progress on your projects.

Objectives

1. To understand the potential contribution of whole genome sequencing and genomic profiling for personalized medicine
2. To place genomic medicine in the context of other emerging trends in healthcare including mobile health, evidence-based medicine, and big-data driven public health
3. To deliver an actual product that can be used in a practical manner to influence health behavior

Evaluation

- 50% Term Project (evaluation criteria will be discussed in class, and include peer assessment)
- 25% Class presentation and participation in weekly discussion
- 25% Final Exam

Sample Ideas for Term Projects

(see http://genomestake.blogspot.com/2014_05_01_archive.html for a summary of the 2014 projects)

Intern with OneCare.me to bring a cohort of Cystic Fibrosis adolescents and young adults into their mobile health platform and begin to evaluate whether and how it changes their behavior

Develop educational materials for the Cystic Fibrosis Foundation by working with partners at Emory University that highlight the positive impact of simple health behaviors

Generate an App that will take an individual's whole genome genotype profiles (for example, downloaded from 23andme) and return up-to-date genetic risk scores for dozens of conditions

Create a module of 3 or 4 lectures on a personalized medicine topic that high school teachers may use in lesson planning (see <http://teachthemicrobiome.weebly.com> for an example from last year)

Work with Georgia Tech Dining Services to institute an incentive program to improve the healthy eating behaviors of students at the University

Help establish a new curriculum in Predictive Health joint between Emory and Georgia Tech

Weekly Topics

Introduction – Professor Gibson

Week 1 What is Predictive Health, and what can I do about it now?

Week 2 Whole Genome Sequencing and Genetic Risk Profiles

The Internet and Mobile Health Applications

Week 3 The role of Social Media in Medicine Spark People

Week 4 Self-knowledge and health networks OneCare.me, mdRevolution

Week 5 Personal Genome Projects 23andme, Harvard PGP

Domains of Health

Week 6 Eating behavior Should fast food be regulated?

Week 7 Drinking behavior How does binge drinking affect you?

Week 8 Exercise behavior Does FitBit make a difference?

Week 9 Smoking and drug abuse Should marijuana be legalized?

Week 10 Parenting behavior TV, stress, and healthy families

Public Health

Week 11 Global foundations: Gates to Clinton Does philanthropy work?

Week 12 The Carter Foundation Eradicating infectious disease

Week 13 The Socioeconomic burden Are there racial differences in disease?

Week 14 Designer Babies Is there a new eugenics emerging?

Week 15 Final Project presentations