Mathematical Biology Seminar & PhD Defense
Monday, July 12, 2021
Speaker: Fabian Santiago
Applied Mathematics Program

Title: Mathematical Investigations of Heritable Microbial Phenotypes

Time: 10am
Zoom Link: https://ucmerced.zoom.us/j/88302227192
Passcode: 481883

Abstract: My PhD work involved developing mathematical models, numerical methods, and performing data driven analyses to investigate two heritable cellular phenotypes. First, I will present mathematical models and numerical methods for the dynamics of protein misfolding (prions) in yeast cells. The prion phenotype in yeast cells is inherited by daughter cells through transmission of protein aggregates during cell division, a non-Mendelian form of inheritance. Prions are not harmful to yeast; this allows for their use as a biological model to gain insight into the mechanisms that govern prion replication and transmission.

Second, I will present data driven mathematical approaches to investigate bacterial antibiotic resistance. In the U.S. more than 35,000 people die from antibiotic-resistant infections and around 3 million get an antibiotic-resistant infection every year (CDC, 2020). I present analyses of biological techniques used to study the evolution of antibiotic resistance and use information from two repositories of infectious isolates from Dignity Health Mercy Medical Center in Merced and a nationwide database from NCBI to compare local and national trends in antibiotic resistance genes.

Dissertation Committee:
Professor Suzanne S. Sindi (Chair and Advisor), Applied Mathematics
Professor Miriam Barlow, Molecular & Cellular Biology
Professor Camille Carvalho, Applied Mathematics
Professor Erica Rutter, Applied Mathematics

Mathematical Biology Seminar runs (typically) Wednesday's at 9am PST.

Full Seminar Schedule: https://appliedmath.ucmerced.edu/node/52

Join our Mailing List: https://bit.ly/2LgjnT6
Join our Slack: https://bit.ly/3il4cIC

UC Merced's Math Biology Seminar is supported by an NSF-RTG grant (#1840265, PI: A. Kim). Graduate students should register for CRN: 35984 for Fall 2021.