

Title: Optimal Stochastic Control of Drug-Resistant Cancer Cell Populations

Linh Huynh

In this talk, I will give an introduction of myself and my research, including the collaborative project with Dr. Peter Thomas (CWRU), Dr. Jacob Scott (Cleveland Clinic), and Dr. Nara Yoon (Cleveland Clinic) on optimal stochastic control of drug-resistant cancer cell populations. We consider a system of two cell types treated with two different drugs: type-A cells are resistant to drug A and sensitive to drug B; type-B cells are resistant to drug B and sensitive to drug A. Resistance to one drug causes sensitivity to the other drug, a phenomenon referred to as collateral sensitivity. Our study of this system utilizes stochastic methods and analysis to develop a drug-switching schedule that 'optimally' reduces cancer cell populations to zero. We hope to extend our study to a network of more than two cell types.