



UNIVERSITY OF CENTRAL FLORIDA

COLLOQUIUM

From Drug Action to Disease Spread: Multiscale Models of Viral Infection and Treatment

Speaker: Dr. Libin Rong

Affiliation: University of Florida

Abstract

Viral infection and antiviral therapy involve processes operating across multiple biological and temporal scales, from drug action and intracellular viral replication to within-host dynamics and transmission between hosts. Mathematical models that connect these scales can reveal mechanisms that are difficult to identify from single-scale models alone. In this talk, I will discuss examples involving HIV, hepatitis C virus (HCV), and SARS-CoV-2. These models link pharmacokinetics and pharmacodynamics to HIV treatment and resistance, intracellular viral replication to HCV kinetics under therapy, and within-host SARS-CoV-2 dynamics to population-level transmission. These examples illustrate how multiscale modeling, combined with data and mathematical analysis, can improve our understanding of viral infection and help evaluate treatment strategies.

Speaker Bio



Libin Rong is Professor and Chair of the Department of Mathematics and Courtesy Affiliate Professor in the Department of Biostatistics at the University of Florida. He received his B.S. in Mathematics (2000) and M.S. in Applied Mathematics (2003) from Fudan University in Shanghai, and his Ph.D. in Applied Mathematics from Purdue University in 2007. His research lies at the interface of mathematics, biology, and medicine, with a focus on mathematical and computational modeling of viral infections and infectious diseases. His work includes studies of drug resistance, immune responses, pharmacokinetics/pharmacodynamics, and multiscale processes, combining mathematical analysis, computation, and experimental or clinical data to understand disease mechanisms and treatment responses.

Event Details

- **Date:** Monday, October 12, 2026
- **Time:** 3:30 PM – 4:30 PM
- **Location:** MSB 318

Refreshments will be served from 2:30pm–3:30pm in MSB 201

School of Data, Mathematical, and Statistical Sciences