Colloquium

Jaekyoung Kim

Korea Advanced Institute of Science and Technology

Thursday, March 5
Room 608, 2925 Campus Green Drive
4-5 pm

Timeseries analysis of stochastic systems with hidden components

Despite dramatic advances in experimental techniques, many facets of intracellular dynamics remain hidden, or can be measured only indirectly. In this talk, I will describe two strategies to analyze stochastic timeseries data from biological systems with hidden parts: replacement of multi-step process with a time delay distribution or quasi-steady-state. Then, I will illustrate how these strategies are applied to understand the processes of protein synthesis, which involves multiple steps such as transcription, translation, folding and maturation, but typically whose intermediates proteins cannot be measured. Furthermore, drugs are also cleared out from our body in multiple steps of metabolism. To estimate the rate of drug clearance, which is a critical factor determining the dose level, a canonical approach has been used in more than 65,000 published papers for last 30 years. I will point out the critical limitation of the canonical approach and propose an alternative approach, which leads to accurate and precise estimation of drug clearance rate.

Refreshments will be served 3:15-3:45 pm in the same location
Room 608, 2925 Campus Green Drive

UNIVERSITY OF
Cincinnati