

1119-92-87

Matthew D Johnston* (matthew.johnston@sjsu.edu), One Washington Square, Duncan Hall 215, San Jose, CA 95192. *Network approaches to the dynamics of biochemical reaction systems.*

In the emerging field of systems biology, networks of biochemical interactions are often modeled using systems of ordinary differential equations. Classical analysis approaches such as numerical simulation and bifurcation analysis, however, are hindered by: (a) the size of the systems; (b) the abundant nonlinearities; and (c) the typically unknown parameter values. Network-based analysis methods have consequently become popular due to their ability to scale efficiently to large problems, identify recurring motifs and patterns, and, surprisingly, identify parameter-independent conditions for many classical dynamical properties.

In this talk, I will introduce and explain some recent applications of network-based approaches to the analysis of biochemical reaction systems. An emphasis will be placed on recurring motifs such as enzymatic cascades and signaling pathways. Some recent work highlighting alternating network representations of biochemical reaction systems will also be introduced. (Received February 09, 2016)