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*Effective methods for stochastic biochemical kinetics*

Stochastic modelling is essential for studying key biological processes, such as signaling chemical pathways in a cell, when some molecular species are in low numbers. The random fluctuations due to low amounts of certain biochemically reacting species have been observed experimentally. Mathematically, the dynamics of these biochemical systems may be accurately described using Markov processes. The biochemical systems arising in applications often evolve on multiple interacting time-scales, meaning their mathematical models are stiff. In this talk I shall present effective methods for overcoming stiffness in stochastic simulations of biochemical systems. We consider spatially homogeneous and heterogeneous models of biochemical kinetics.