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## **Delay Differential Models in Biosciences: Numeric and Analytic**

One of the most significant challenges in biosciences is to formulate meaningful mathematical models that faithfully represent scientific observations and theories. Although ordinary differential and partial differential equations are often used as models, many phenomena in bioscience (for which observations have been reported in the literature) can be modelled by suitable functional differential equations incorporating time-lags or memory effects. Such equations are, in general, parameterized by scientifically meaningful parameters. This talk presents the authors research in the numerical treatment of delay differential equations (DDEs) that occur in certain areas of bioscience. The main novelty concerns parameter estimation in DDEs, and a sensitivity analysis of the solution with respect to the parameters and of the parameters with respect to the observations. When modelling in bioscience, DDEs are frequently more qualitatively and quantitatively consistent with real phenomena than differential equations with no time-lags.