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DISTRIBUTION OF DELAYS IN A PHARMACODYNAMIC MODEL

Time delays occur naturally in pharmacokinetic and pharmacodynamic (PK/PD) processes, but the form in which they are introduced in the models is not always entirely obvious, the distribution of delays being typically ignored or represented empirically. We present a model of chemotherapy-induced myelosuppression using differential equations with distributed delays, to take into account the delay between administration of the drug and the observed effect. The transit compartment yields a single differential equation with a bimodal distribution of delays. We discuss the stability of this system, obtaining a stability chart in a two parameter space, and possible oscillatory solutions.

Joint work with Andreea Rimbu Pruncut.