

Parameter Estimation for Physiologically Based Pharmacokinetic(PBPK) Model Using Bayesian Inference

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Physiologically based pharmacokinetic(PBPK) model is mathematical technic for predicting absorption, degradation, excretion and other metabolisms in drug delivery system. It is useful technic for regulating dose to prevent side effect of drug and observing drug concentration at a particular time during the clinical demonstration. Since PBPK model is expressed as simultaneous differential equation with various parameters, we need to solve non-linear differential equation and estimate parameters to predict concentration as a function of time at each organs. However, because experimental data of drug delivery system are noisy and sparse, it is difficult to estimate correct parameter value. Moreover, parameters of PBPK model don't have exact value for every subject. Therefore, we need to describe parameters as probability density function which indicate the probability of parameter value. In these reasons, we introduce Bayesian inference for parameter estimation of PBPK model. We conduct case study about Tegafur delivery system and draw the reasult of estimated parameters value and its probability density function.