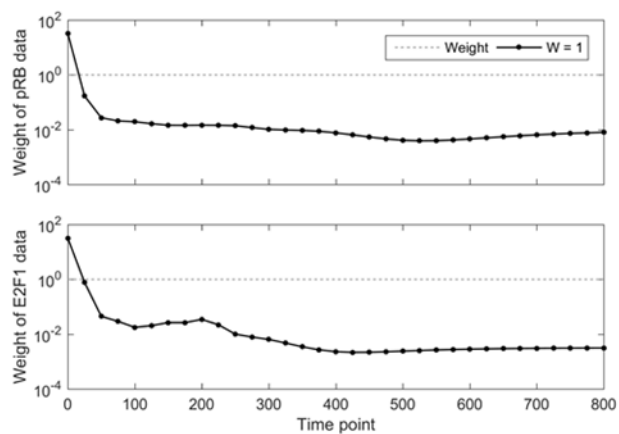
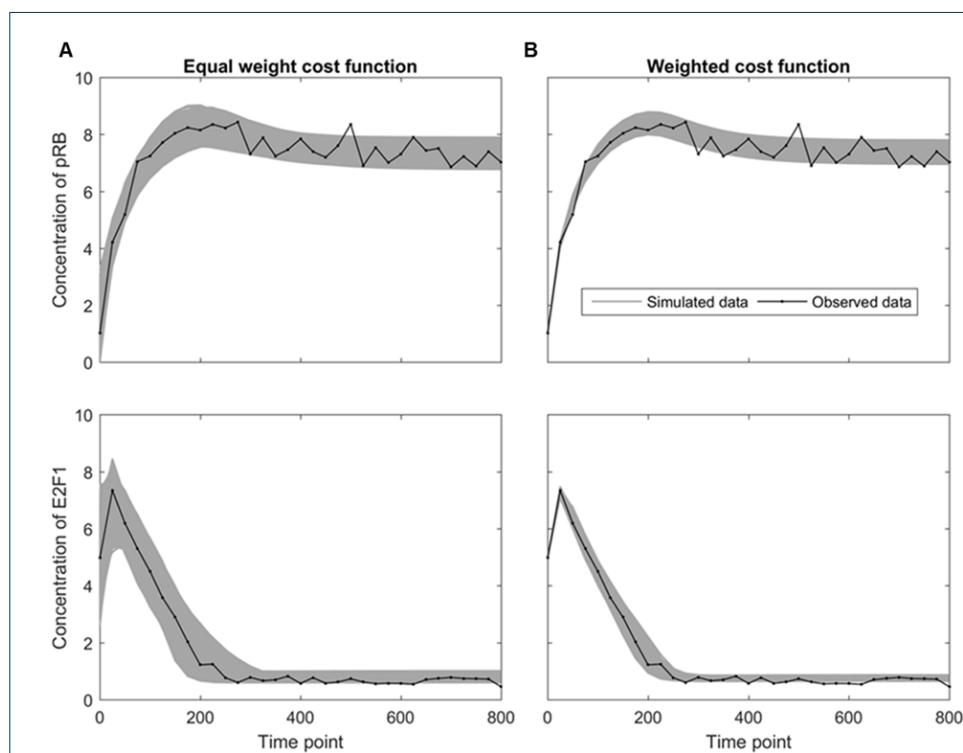


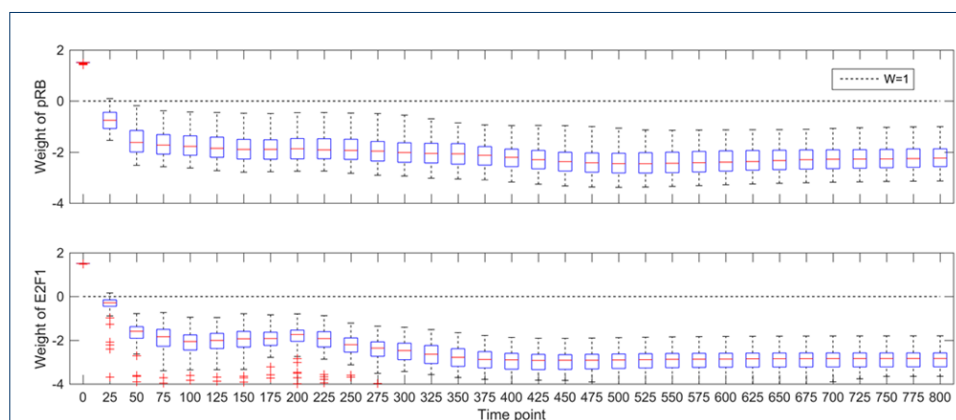
## Supplementary Figures



**Figure S1 Weights of the G1/S transition model with 12-parameters.** Each dot represents the weight of a data point, and the dashed line corresponds to the weights in the equal-weight cost function.



**Figure S2 Sampling algorithm for evaluating G1/S transition with 12-parameters.** The black curve represents experimental data and gray curves represent simulated datasets obtained from the acceptable parameters. The collections of gray curves form the gray belts, each representing the variation of model prediction of one variable, based on the acceptable parameters obtained by the equal-weight or weighted cost function. A) The equal-weight cost function leads to highly unbalanced belt width because of the large number of data points in the steady state region. B) The weighted cost function leads to thinner belts, indicating that the weighted formulation is able to better constrain the estimated parameters.



**Figure S3 G1/S transition with 12-parameters: robustness of the uncertainty-based weights.** The dotted line represents the equal-weight cost function. Each box represents the weights for one data point, computed from the 100 noisy experimental datasets.

