

Supporting Information

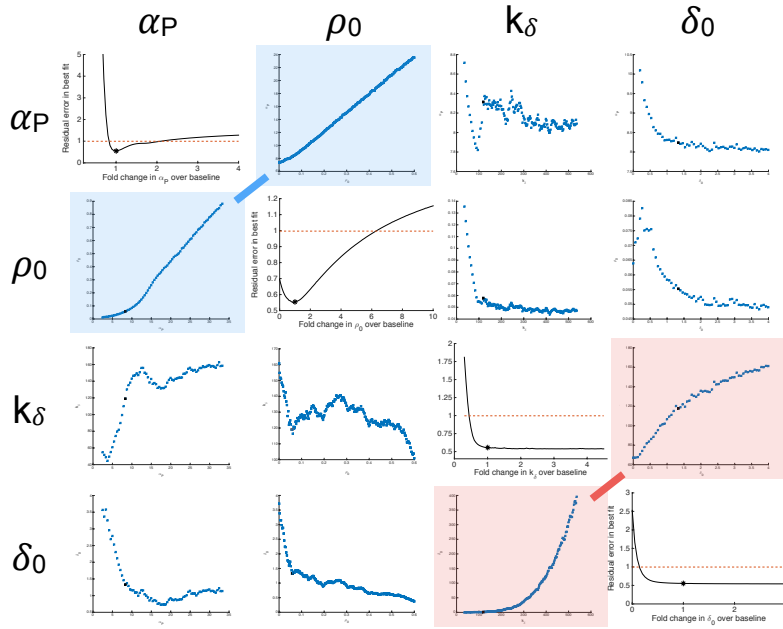


Figure S1: **Profile Likelihoods and Parameter Relationships for taxol model.** Profile likelihoods are shown on the diagonal (same as those given in Fig 3, with the resulting parameter relationships given in the corresponding column). The combinations examined further in Fig 4 are highlighted in blue and red. The profile for k_α is given in Fig 3 and not shown here, since k_α is fully identifiable and so is not considered as a potential candidate for identifiable combinations. While α_P and ρ_0 have also finite confidence bounds, they are fairly wide, so we consider the parameter relationships for these two parameters as well, even though they are technically practically identifiable.

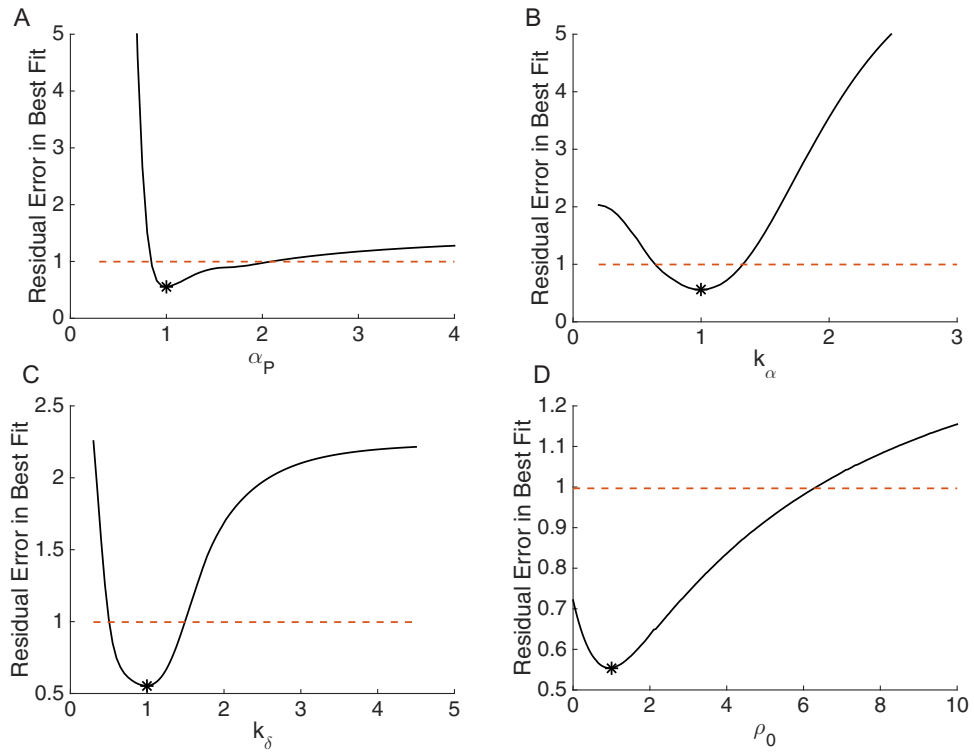


Figure S2: **Profile Likelihoods for the taxol model with δ_0 Fixed.** Profile likelihoods (solid lines) for A: α_P , B: ρ_0 , C: k_α , D: k_δ . Thresholds for 95% confidence intervals shown as dashed lines, and the parameter estimates given in Table 1 are shown as asterisks (*).

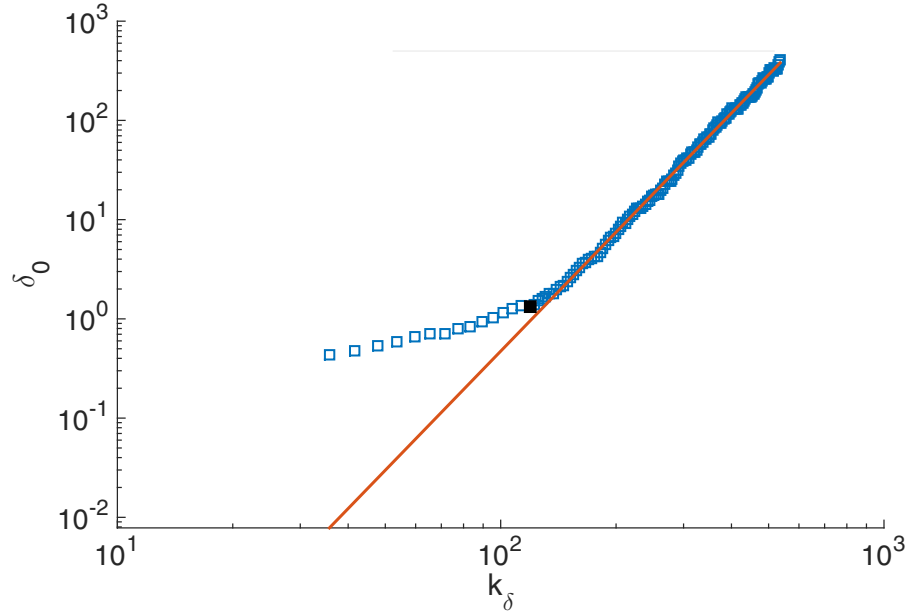


Figure S3: **Log-log Plot of taxol model Identifiable Combination.** Parameter relationships between k_δ and δ_0 as shown in Fig 4, but plotted on a log-log scale. Optimal parameter estimates for each value of k_δ are shown as blue squares, with the overall optimal estimate from Table 1 shown as a black square. The red line indicates the estimated local practically identifiable combination, which highlights the large linear region to the right of the estimate of k_δ .

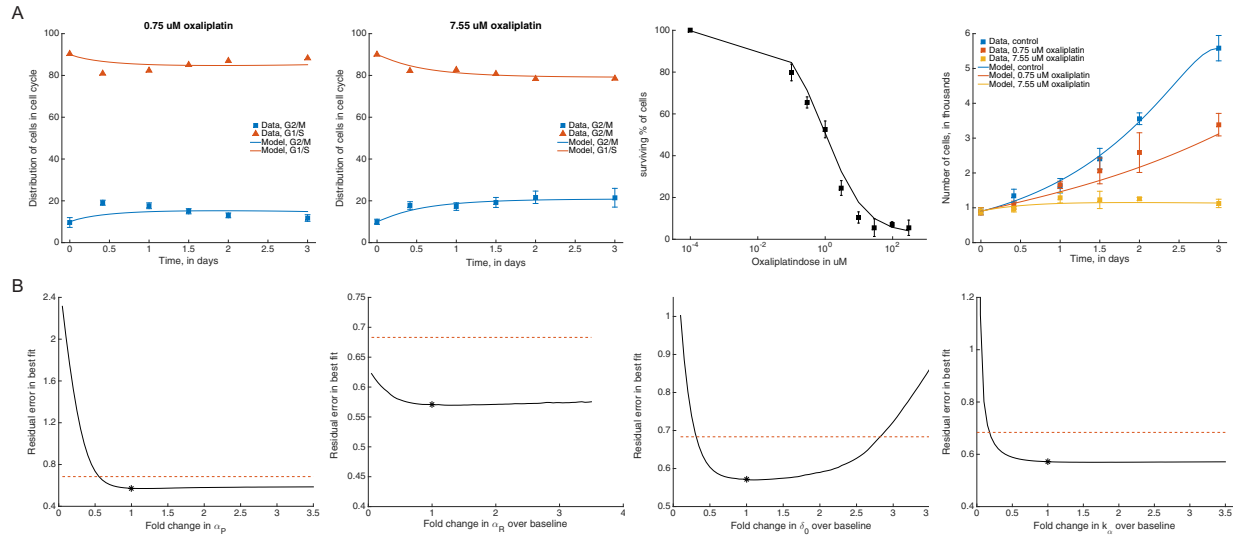


Figure S4: **Fits and profile likelihoods using reduced model with $k_\delta = 0$.** A) Model fits to data, similar to Fig 2. B) Profile likelihoods analogous to Fig 5, however note the worsening of the profile for α_R .

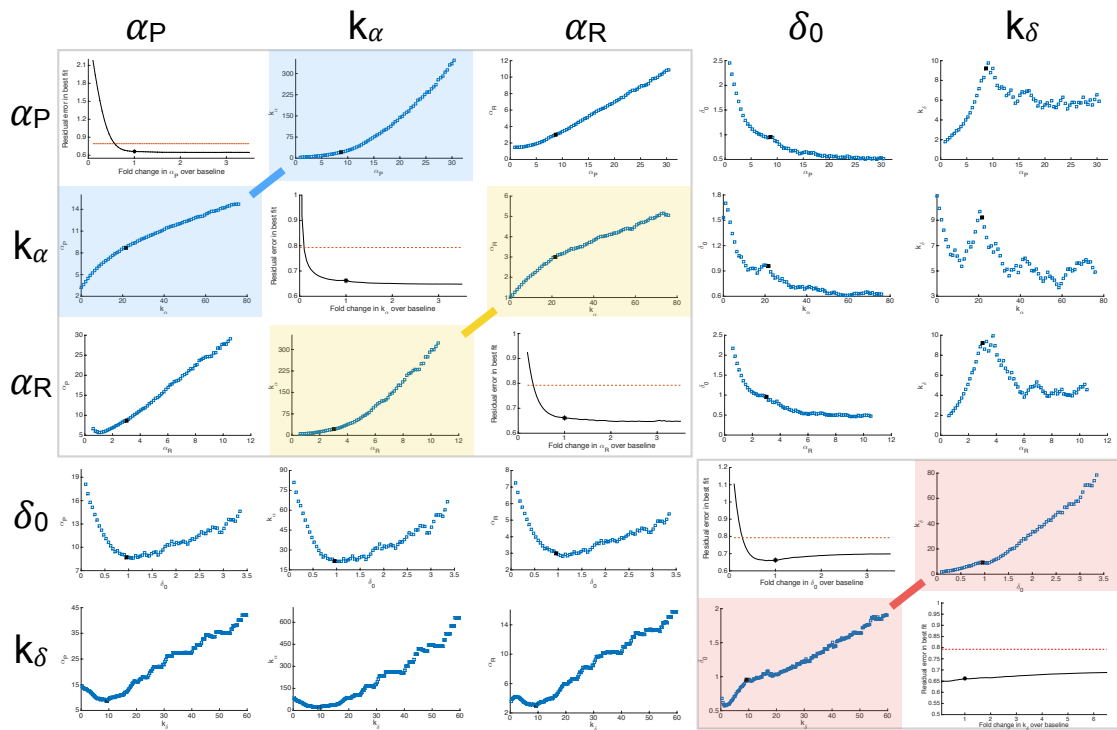


Figure S5: **Profile Likelihoods and Parameter Relationships for oxaliplatin model.** Profile likelihoods are shown on the diagonal (same as those given in Fig 5, with the resulting parameter relationships given in the corresponding column). The combinations examined further in Fig 7 are highlighted in blue, yellow, and red.

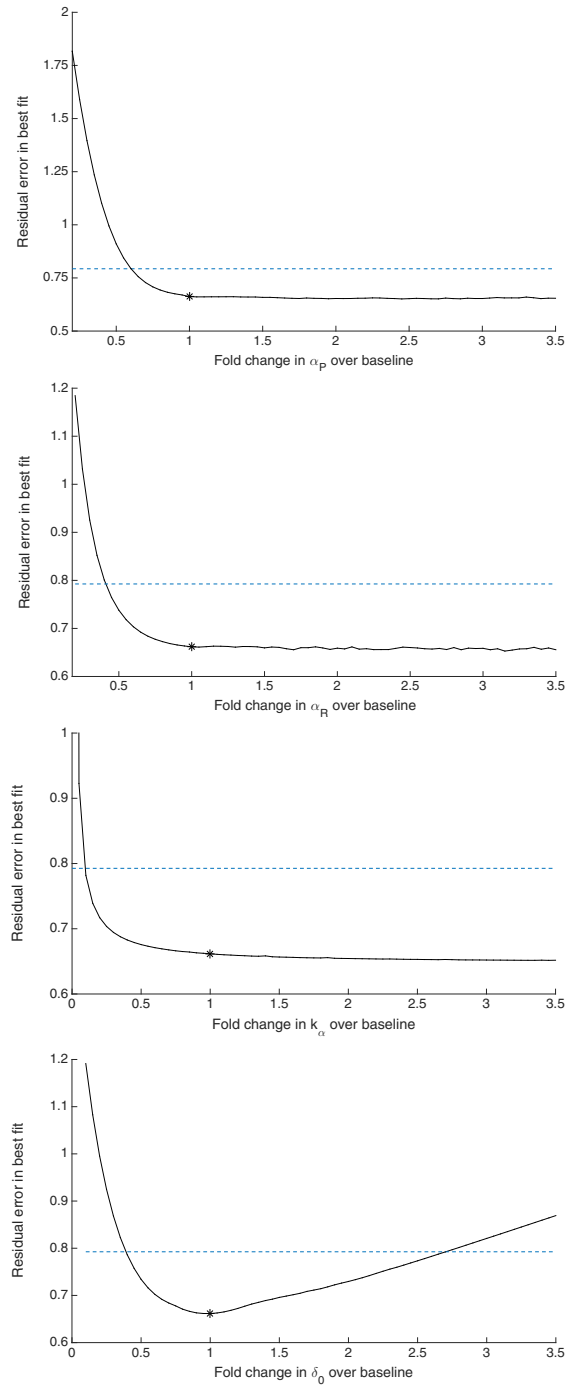


Figure S6: **Profile likelihoods for oxaliplatin model with k_δ fixed to estimated value.** Profile likelihoods analogous to Fig 5, with k_δ fixed. Note the finite confidence interval for δ_0 but unchanged confidence intervals for α_P , α_R , and k_α .

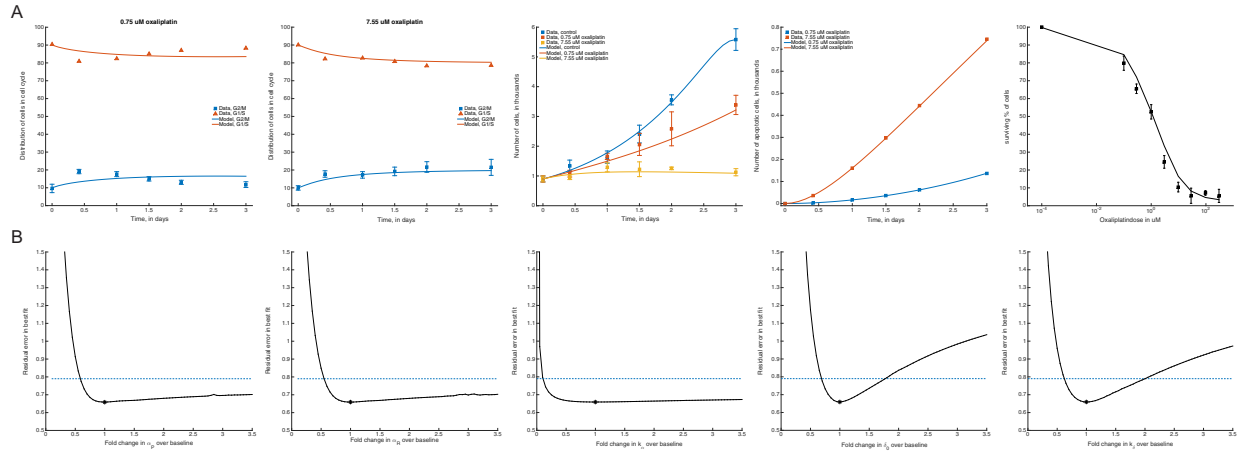


Figure S7: Model fits (A) and profile likelihoods (B) using apoptotic cell data.

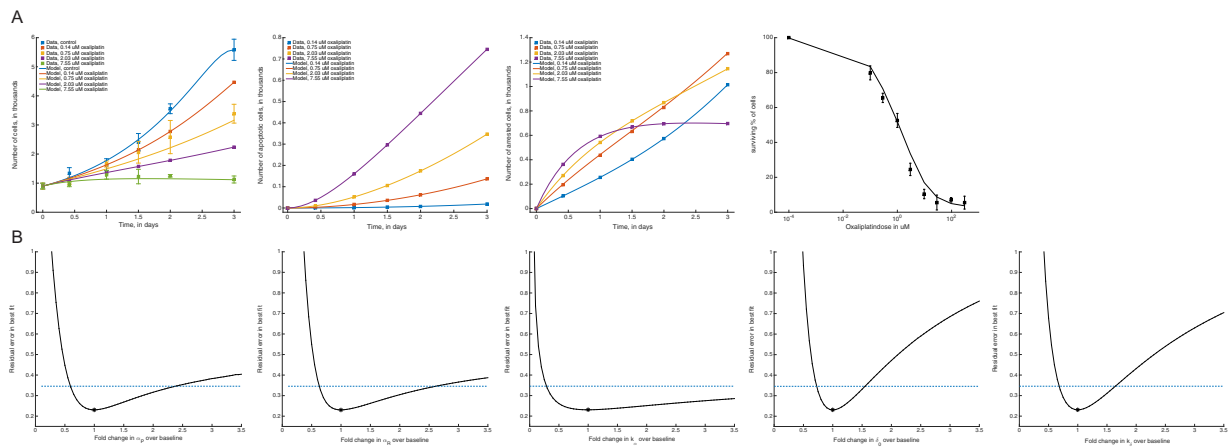


Figure S8: Model fits (A) and profile likelihoods (B) using arrested cell data instead of cell cycle distribution data.

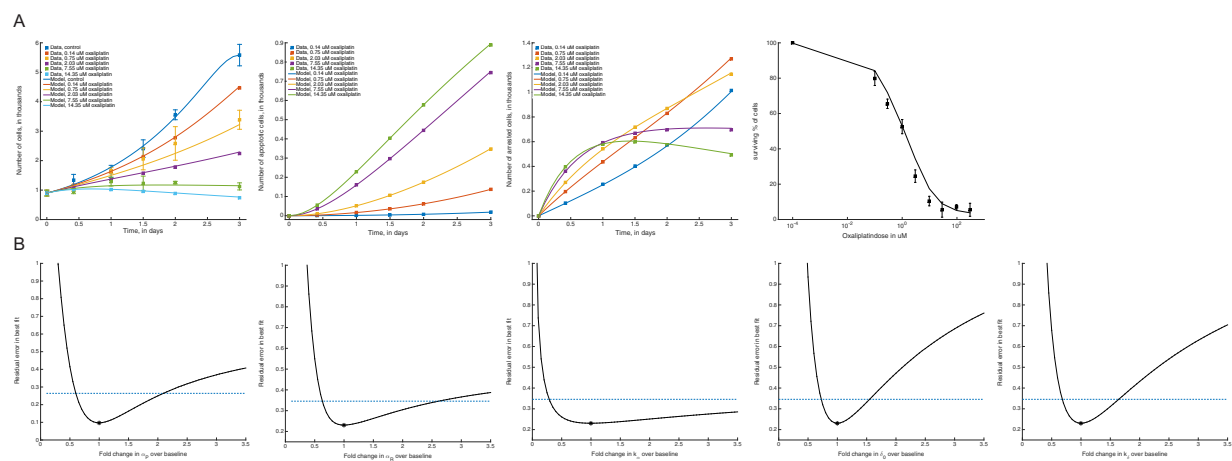


Figure S9: Model fits (A) and profile likelihoods (B) using apoptotic and arrested cell data instead of cell cycle and dose response data.