

S1 Text: Mass balance equations

change	calculation
$\Delta[E_A]$	$= ((k_{\text{off}}^S + k_{\text{cat}})[E_A S] - k_{\text{on}}^S[S][E_A] + k_{\text{trans}}^I[E_I] - k_{\text{trans}}^A[E_A])\Delta t$
$\Delta[E_A S]$	$= (k_{\text{on}}^S[S][E_A] - (k_{\text{off}}^S + k_{\text{cat}})[E_A S])\Delta t$
$\Delta[E_I]$	$= (k_{\text{trans}}^A[E_A] - k_{\text{trans}}^I[E_I] + k_{\text{off}}^R[E_I R] - k_{\text{on}}^R[R][E_I])\Delta t$
$\Delta[E_I R]$	$= (k_{\text{on}}^R[R][E_I] - k_{\text{off}}^R[E_I R])\Delta t$
$\Delta[E_{\text{tot}}]$	$= \Delta[E_A] + \Delta[E_A S] + \Delta[E_A R] + \Delta[E_I]$
	$= 0$

Table A: Table outlining the equations for the change in population of each state in the system for an inactive state binding inhibitor using Euler integration of Equation 2 over time step Δt . The mass balance equation for the change in the total concentration, $\Delta[E_{\text{tot}}]$, is given and shown to be zero.

change	calculation
$\Delta[E_A]$	$= ((k_{\text{off}}^S + k_{\text{cat}})[E_A S] - k_{\text{on}}^S[S][E_A] + k_{\text{trans}}^I[E_I] - k_{\text{trans}}^A[E_A] + k_{\text{off}}^R[E_A R] - k_{\text{on}}^R[R][E_A])\Delta t$
$\Delta[E_A S]$	$= (k_{\text{on}}^S[S][E_A] - (k_{\text{off}}^S + k_{\text{cat}})[E_A S])\Delta t$
$\Delta[E_A R]$	$= (k_{\text{on}}^R[R][E_A] - k_{\text{off}}^R[E_A R])\Delta t$
$\Delta[E_I]$	$= (k_{\text{trans}}^A[E_A] - k_{\text{trans}}^I[E_I])\Delta t$
$\Delta[E_{\text{tot}}]$	$= \Delta[E_A] + \Delta[E_A S] + \Delta[E_I] + \Delta[E_I R]$
	$= 0$

Table B: Table outlining the equations for the change in population of each state in the system for an active state binding inhibitor using Euler integration of Equation 2 over time step Δt . The mass balance equation for the change in the total concentration, $\Delta[E_{\text{tot}}]$, is given and shown to be zero.