S3 CME for discrete model

Let $q(n_1, n_2, t)$ be the density for n_1 sensitive cells and n_2 resistant cells. Let λ_i denote the proliferation rate of each cell population, and δ_i denote the death rate of each cell population (one of which will be zero). We have that

$$\begin{aligned}\frac{\mathrm{d}q(n_1,n_2,t)}{\mathrm{d}t} = &(n_1-1)\lambda_1 q(n_1-1,n_2,t) + (n_1+1)\delta_1 q(n_1+1,n_2,t)\\ &+ (n_2-1)\lambda_2 q(n_1,n_2-1,t) + (n_2+1)\delta_2 q(n_1,n_2+1,t)\\ &+ n_1 r_{12} q(n_1+1,n_2-1,t) + n_2 r_{21} q(n_1-1,n_2+1,t)\\ &- (n_1\lambda_1 + n_1\delta_1 + n_2\lambda_2 + n_2\delta_2) q(n_1,n_2,t).\end{aligned} \tag{1}$$

To obtain the mass function for the total cell count, $q(n, t)$, we consider that

$$q(n,t) = \sum_{n_1=0}^{\infty} q(n_1, n-n_1, t). \tag{2}$$

In practice, we consider a partial sum truncated at $n_1 = 50$, which we find to be sufficient given the maximum cell counts observed in Fig. 8 of the main text.