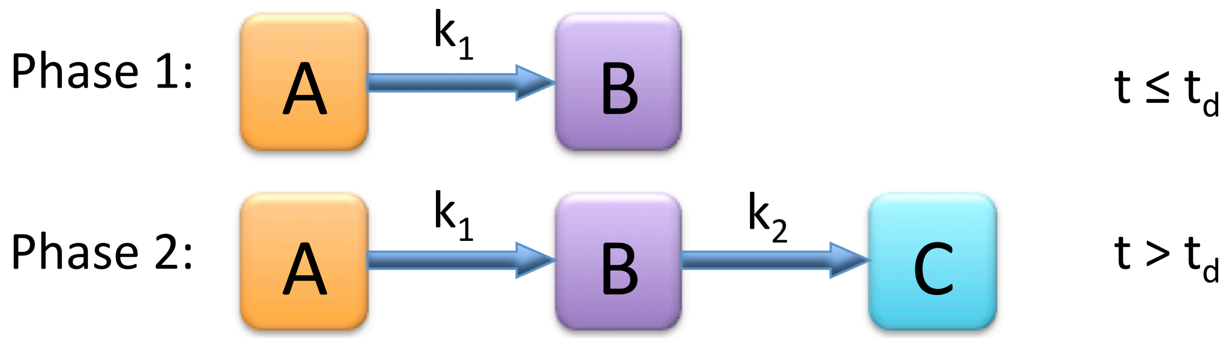
Supplemental Material:



The figure above shows the three-compartment model used to simulate events after myocardial infarction. In phase 1, beginning at the onset of injury, cardiomyocytes start to transition from a healthy state (A) to a necrotic state (B) with a rate constant of K_1. In response to the necrotic material, neutrophils infiltrate the infarcted myocardium. This is followed 12-24 hours after infarction by a macrophage infiltrate, which begins to clear the necrotic debris. We define the time until the onset of the removal of necrotic debris by the macrophage infiltrate as t_d. In phase 2, beginning at t_d, necrotic cells in compartment B begin to transition to a cleared state (C). The transition of cells from a necrotic state (B) to a cleared stated (C) is described by the rate constant K_2. The rate equations governing these processes are as follows:

$$\begin{cases} \dfrac{dA}{dt} = -k_1 A \\ \dfrac{dB}{dt} = k_1 A - k_2 B \end{cases}$$

We assume that, at $t = 0$ *(beginning of phase 1),* $A = A_0$, $B = 0$, *and* $C = 0$. In addition, $k_2 = 0$. *At* $t = t_d$ *(beginning of phase 2),* $A = A_0 e^{-k_1 t_d}$, $B = A_0(1 - e^{-k_1 t_d})$, *and* $C = 0$. By solving the rate equations, B can be expressed using the following equation:

$$B = \begin{cases} A_0(1 - e^{-k_1 t}) & t \le t_d \\ \dfrac{k_1 A_0 e^{-k_1 t_d}}{(k_2 - k_1)} A_{t=t_d}\left[e^{-k_1(t-t_d)} - e^{-k_2(t-t_d)}\right] + A_0(1 - e^{-k_1 t_d})e^{-k_2(t-t_d)} & t > t_d \end{cases}$$

The above equation was then used to fit the R_1 values (Figure 5B) at different time points after myocardial infarction using Matlab (Mathworks, Natick, MA). We found that the rate constant k_1 equaled $0.474\ hr^{-1}$ and k_2 equaled $0.006\ hr^{-1}$. The time delay, t_d, for macrophage infiltration equaled 18 hrs.