

Problem Set

due 20Feb20

generally,

$$\dot{m} = r_x u - (\theta_m + \nu) m + \lambda$$

$$\dot{p} = r_L w - (\theta_p + \nu) p$$

Since the system is cell-free, there is no cell boundary (ie. no intracellular dilution). Furthermore, V_R is constant (ie $\dot{V}_R = 0$)

~~$B = V_R$~~

~~$$\dot{N} = \dot{B} B^{-1} = \frac{\dot{X}}{X} + \frac{\dot{V}_R}{V_R}$$~~

$$B = V_L = 15 \mu L \Rightarrow \dot{B} = 0$$

$$\dot{N} = \dot{B} B^{-1} = 0$$

$$\therefore \nu = 0$$

So, the balances for m and p are:

$$\dot{m} = r_x u - \theta_m m + \lambda$$

$$\dot{p} = r_L w - \theta_p p$$