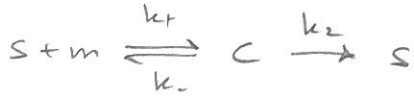


## SIRNA MODEL

$S_0$ : AMOUNT / CONCENTRATION OF SIRNA DELIVERED AT  $t=0$ .

REACTION MODEL



$$(1) \dot{C} = k_+ m \cdot S - (k_- + k_2) C \stackrel{!}{=} 0$$

VALID IF  $k_- \ll k_2$  AND IF REACTIONS ARE FAST COMPARED W/ SPONTANEOUS mRNA AND SIRNA DECAY/DILUTION.

$$(2) \dot{S} = -\gamma_s S - k_+ m S + (k_- + k_2) C \stackrel{(1)}{=} -\gamma_s S \Rightarrow S(t) = S_0 e^{-\gamma_s t}$$

$$(3) \dot{m} = \alpha_m - \gamma_m m - k_+ m S + k_- C \stackrel{(1)}{=} \alpha_m - \gamma_m m - k_2 C$$

From (1):  $C = \frac{k_+}{k_- + k_2} m \cdot S = m S / K_m$ ,  $K_m := (k_- + k_2) / k_+$

Into (3):  $\dot{m} = \alpha_m - \gamma_m m - \frac{k_2}{K_m} m S \stackrel{!}{=} 0$

SHOULD HOLD AFTER mRNA HAS EQUILIBRATED WITH SIRNA

$$\Rightarrow m = \frac{\alpha_m}{\gamma_m + \frac{k_2}{K_m} S(t)} = \frac{\alpha_m / \gamma_m}{1 + \frac{k_2}{\gamma_m} \frac{S_0 e^{-\gamma_s t}}{K_m}}$$

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