$$
\begin{cases}
\dfrac{d\mathrm{C}}{dt} = -k_1 \dfrac{[NF\kappa B]^{n_1}}{[NF\kappa B]^{n_1} + K_{D1}^{n_1}} \cdot \mathrm{C} + \mathrm{k_{-1}} \cdot \mathrm{O} + \mathrm{k_{-3}} \dfrac{\mathrm{A^{n_3}}}{\mathrm{A^n} + \mathrm{K_{D3}^{n_3}}} \\
\dfrac{d\mathrm{O}}{dt} = k_1 \dfrac{[NF\kappa B]^{n_1}}{[NF\kappa B]^{n} + K_{D1}^{n_1}} \cdot \mathrm{C} - \mathrm{k_2} \dfrac{\mathrm{[NF\kappa B]^{n_2}}}{\mathrm{[NF\kappa B]^{n_2}} + \mathrm{K_{D2}^{n_2}}} \cdot \mathrm{O} - \mathrm{k_{-1}} \cdot \mathrm{O} + \mathrm{k_{-2}} \cdot \\
\dfrac{d\mathrm{A}}{dt} = k_2 \dfrac{[NF\kappa B]^{n_2}}{[NF\kappa B]^{n_2} + K_{D2}^{n_2}} \cdot \mathrm{O} - \mathrm{k_{-2}} \cdot \mathrm{A} - \mathrm{k_{-3}} \dfrac{\mathrm{A^{n_3}}}{\mathrm{A^{n_3}} + \mathrm{K_{D3}^{n_3}}} \\
\dfrac{dmRNA}{dt} = k_p \cdot A - k_{degm} \cdot mRNA \\
\mathrm{C + O + A = 1}
\end{cases}
$$