

$$\begin{aligned}
\frac{d[\text{OOHL}]}{dt} &= -(k_{\text{ROOHL}} \times [\text{FreeTraR}] \times [\text{OOHL}]) + k_{\text{OOHL}} \times [\text{TraI}] - k_{\text{dOOHL}} \times [\text{OOHL}] - k_{\text{ROOHL}} \times [\text{FreeTraR}] \\
\frac{d[\text{TraA}]}{dt} &= k_{\text{tpA}} \times [\text{traAmRNA}] - k_{\text{dpA}} \times [\text{TraA}] \\
\frac{d[\text{traRmRNA}]}{dt} &= k_{\text{traRbasal}} \times [\text{traRPromoter}] + \frac{k_{\text{tmR}} \times [\text{traRPromoter}] \times [\text{octopine}]}{[\text{octopine}] + K_{\text{m}_{\text{tmR}}}} - k_{\text{dmR}} \times [\text{traRmRNA}] \\
\frac{d[\text{hotFreeTraR}]}{dt} &= k_{\text{tpR}} \times [\text{traRmRNA}] \times [\text{radiolabel}] - k_{\text{dpR}} \times [\text{hotFreeTraR}] - k_{\text{ROOHL}} \times [\text{hotFreeTraR}] \\
\frac{d[\text{unradiolabel}]}{dt} &= 0 \\
\frac{d[\text{traAPromoter}]}{dt} &= k_{\text{doublingtime}} \times [\text{traAPromoter}] \\
\frac{d[\text{octopine}]}{dt} &= 0 \\
\frac{d[\text{TraI}]}{dt} &= k_{\text{tpI}} \times [\text{traImRNA}] - k_{\text{dpI}} \times [\text{TraI}] \\
\frac{d[\text{traIPromoter}]}{dt} &= k_{\text{doublingtime}} \times [\text{traIPromoter}] \\
\frac{d[\text{traRPromoter}]}{dt} &= k_{\text{doublingtime}} \times [\text{traRPromoter}] \\
\frac{d[\text{traImRNA}]}{dt} &= k_{\text{traIbasal}} \times [\text{traIPromoter}] + \frac{k_{\text{tmI}} \times [\text{traIPromoter}] \times [\text{TraRDimer}]}{[\text{TraRDimer}] + K_{\text{m}_{\text{tmI}}}} - k_{\text{dmI}} \times [\text{traImRNA}] \\
\frac{d[\text{radiolabel}]}{dt} &= 0 \\
\frac{d[\text{BoundTraR}]}{dt} &= k_{\text{ROOHL}} \times [\text{FreeTraR}] \times [\text{OOHL}] - 2k_{\text{dimR}} \times [\text{BoundTraR}]^2 \\
\frac{d[\text{FreeTraR}]}{dt} &= k_{\text{tpR}} \times [\text{traRmRNA}] \times [\text{unradiolabel}] - k_{\text{dpR}} \times [\text{FreeTraR}] - k_{\text{ROOHL}} \times [\text{FreeTraR}] \\
\frac{d[\text{Plac}]}{dt} &= 0 \\
\frac{d[\text{hotBoundTraR}]}{dt} &= k_{\text{ROOHL}} \times [\text{hotFreeTraR}] \times [\text{OOHL}] - 2k_{\text{dimR}} \times [\text{hotBoundTraR}]^2 \\
\frac{d[\text{traAmRNA}]}{dt} &= k_{\text{traAbasal}} \times [\text{traAPromoter}] + \frac{k_{\text{tmA}} \times [\text{traAPromoter}] \times [\text{TraRDimer}]}{[\text{TraRDimer}] + K_{\text{m}_{\text{tmA}}}} - k_{\text{dmA}} \times [\text{traAmRNA}] \\
\frac{d[\text{TraRDimer}]}{dt} &= k_{\text{dimR}} \times [\text{BoundTraR}]^2 \\
[\text{hotTotalTraR}] &= [\text{hotFreeTraR}] + [\text{hotBoundTraR}] + 2[\text{hotTraRDimer}] \\
\frac{d[\text{hotTraRDimer}]}{dt} &= k_{\text{dimR}} \times [\text{hotBoundTraR}]^2
\end{aligned}$$