sgRNA transcription/degradation:

$$1)\ \frac{dC_{\mathrm{sgRNA}}}{dt} = k_{1\_\mathrm{sg}} - k_{2\_\mathrm{sg}} C_{\mathrm{sgRNA}}$$

dCas9 mRNA transcription/degradation:

$$2)\ \frac{dC_{\mathrm{dCas9\_mRNA}}}{dt} = k_{1\_\mathrm{dCas9\_mRNA}} - k_{2\_\mathrm{dCas9\_mRNA}} C_{\mathrm{dCas9\_mRNA}}$$

dCas9 translation/degradation:

$$3)\ \frac{dC_{\mathrm{dCas9}}}{dt} = k_{3\_\mathrm{dCas9}} - k_{4\_\mathrm{dCas9}} C_{\mathrm{dCas9}}$$

dCas9:sgRNA complex (repr) formation:

$$4)\ \frac{dC_{\mathrm{repr}}}{dt} = k_{\mathrm{f\_repr}} C_{\mathrm{dCas9}} C_{\mathrm{sgRNA}} - k_{\mathrm{d\_repr}} C_{\mathrm{repr}}$$

target gene RNA(tg_mRNA) transcription/degradation:

$$5)\ \frac{dC_{\mathrm{tg\_mRNA}}}{dt} = k_{\mathrm{1b\_tg\_mRNA}} + k_{1\_\mathrm{tg\_mRNA}} \cdot \frac{1}{1 + (K_{\mathrm{B}} C_{\mathrm{repr}})^n} - k_{2\_\mathrm{tg\_mRNA}} C_{\mathrm{tg\_mRNA}}$$

target gene protein(tg_Prot) translation/degradation:

$$6)\ \frac{dC_{\mathrm{tg\_Prot}}}{dt} = k_{3\_\mathrm{tg\_Prot}} - k_{4\_\mathrm{tg\_Prot}} C_{\mathrm{tg\_Prot}}$$