Resulting Temporal ODEs with the needed parameters

specific to pTet-circuit

$$\begin{matrix}(16)\\(35)\end{matrix} \Rightarrow \frac{d[FlhDC]}{dt} = b_{16}[pTet]_{eq} - \gamma_{35}[FlhDC] \tag{59a}$$

$$\begin{matrix}(55)\\(56)\end{matrix} \Rightarrow \frac{d[FlhDC]}{dt} = \beta_{16} \cdot \frac{K_{13}^{n_{13}}}{K_{13}^{n_{13}} + \left(\frac{K_{12}^{n_{aTc}}}{K_{12}^{n_{aTc}} + [aTc]_i^{n_{aTc}}} \cdot [TetR]\right)^{n_{13}}} - \gamma_{35}[FlhDC] \tag{59}$$

specific to pFlhDC-circuit

$$\begin{matrix}(17)\\(22)\\(35)\end{matrix} \Rightarrow \frac{d[FlhDC]}{dt} = b_{17}[pFlhDC^{free}]_{eq} + b_{22}[(FliA)_{n_6} \bowtie pFlhDC]_{eq} - \gamma_{35}[FlhDC] \tag{60a}$$

$$\begin{matrix}(54)\\(58)\end{matrix} \Rightarrow \frac{d[FlhDC]}{dt} = \frac{K_{15}^{n_{15}}}{K_{15}^{n_{15}} + [OmpR^*]^{n_{15}}} \left(\beta_{17} \cdot \frac{K_6^{n_6}}{K_6^{n_6} + [FliA]^{n_6}} + \beta_{22} \cdot \frac{[FliA]^{n_6}}{K_6^{n_6} + [FliA]^{n_6}}\right) - \gamma_{35}[FlhDC] \tag{60}$$

$$\begin{matrix}(18)\\(23)\\(36)\end{matrix} \Rightarrow \frac{d[FliA]}{dt} = b_{18}[(FlhDC)_{n_1} \bowtie pFliA]_{eq} + b_{23}[(FliA)_{n_7} \bowtie pFliA]_{eq} - \gamma_{36}[FliA] \tag{61a}$$

$$\begin{matrix}(44)\\(45)\end{matrix} \Rightarrow \frac{d[FliA]}{dt} = \beta_{18} \cdot \frac{[FlhDC]^{n_1}}{K_1^{n_1} + [FlhDC]^{n_1}} + \beta_{23} \cdot \frac{[FliA]^{n_7}}{K_7^{n_7} + [FliA]^{n_7}} - \gamma_{36}[FliA] \tag{61}$$

$$\begin{matrix}(24)\\(25)\\(37)\end{matrix} \Rightarrow \frac{d[FP1]}{dt} = b_{24}[(FlhDC)_{n_2} \bowtie pFliL]_{eq} + b_{25}[(FliA)_{n_8} \bowtie pFliL]_{eq} - \gamma_{37}[FP1] \tag{62a}$$

$$\begin{matrix}(46)\\(47)\end{matrix} \Rightarrow \frac{d[FP1]}{dt} = \beta_{24} \cdot \frac{[FlhDC]^{n_2}}{K_2^{n_2} + [FlhDC]^{n_2}} + \beta_{25} \cdot \frac{[FliA]^{n_8}}{K_8^{n_8} + [FliA]^{n_8}} - \gamma_{37}[FP1] \tag{62}$$

specific to pFlgA-circuit

$$\begin{matrix}(26)\\(27)\\(38)\end{matrix} \Rightarrow \frac{d[FP2]}{dt} = b_{26}[(FlhDC)_{n_3} \bowtie pFlgA]_{eq} + b_{27}[(FliA)_{n_9} \bowtie pFlgA]_{eq} - \gamma_{38}[FP2] \tag{63a}$$

$$\begin{matrix}(48)\\(51)\end{matrix} \Rightarrow \frac{d[FP2]}{dt} = \beta_{26}\cdot\frac{[FlhDC]^{n_3}}{K_3^{n_3}+[FlhDC]^{n_3}}+\beta_{27}\cdot\frac{[FliA]^{n_9}}{K_9^{n_9}+[FliA]^{n_9}}-\gamma_{38}[FP2] \quad (63)$$

$$\begin{matrix}(28)\\(29)\\(38)\end{matrix} \Rightarrow \frac{d[FP2]}{dt} = b_{28}[(FlhDC)_{n_4}\bowtie pFlgB]_{eq}+b_{29}[(FliA)_{n_{10}}\bowtie pFlgB]_{eq}-\gamma_{38}[FP2] \quad (64a)$$

$$\begin{matrix}(50)\\(51)\end{matrix} \Rightarrow \frac{d[FP2]}{dt} = \beta_{28}\cdot\frac{[FlhDC]^{n_4}}{K_4^{n_4}+[FlhDC]^{n_4}}+\beta_{29}\cdot\frac{[FliA]^{n_{10}}}{K_{10}^{n_{10}}+[FliA]^{n_{10}}}-\gamma_{38}[FP2] \quad (64)$$

$$\begin{matrix}(30)\\(31)\\(39)\end{matrix} \Rightarrow \frac{d[FP3]}{dt} = b_{30}[(FlhDC)_{n_5}\bowtie pFlhB]_{eq}+b_{31}[(FliA)_{n_{11}}\bowtie pFlhB]_{eq}-\gamma_{39}[FP3] \quad (65a)$$

$$\begin{matrix}(52)\\(53)\end{matrix} \Rightarrow \frac{d[FP3]}{dt} = \beta_{30}\cdot\frac{[FlhDC]^{n_5}}{K_5^{n_5}+[FlhDC]^{n_5}}+\beta_{31}\cdot\frac{[FliA]^{n_{11}}}{K_{11}^{n_{11}}+[FliA]^{n_{11}}}-\gamma_{39}[FP3] \quad (65)$$

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specific to pTet-circuit

$$\begin{matrix}(19)\\(32)\\(40)\end{matrix} \Rightarrow \frac{d[TetR]}{dt} = b_{30}[(FlhDC)_{n_5}\bowtie pFlhB]_{eq}+b_{31}[(FliA)_{n_{11}}\bowtie pFlhB]_{eq}-\gamma_{40}[TetR] \quad (66a)$$

$$\begin{matrix}(52)\\(53)\end{matrix} \Rightarrow \frac{d[TetR]}{dt} = \beta_{30}\cdot\frac{[FlhDC]^{n_5}}{K_5^{n_5}+[FlhDC]^{n_5}}+\beta_{31}\cdot\frac{[FliA]^{n_{11}}}{K_{11}^{n_{11}}+[FliA]^{n_{11}}}-\gamma_{40}[TetR] \quad (66)$$

$$eqn.(55) \quad gives \quad then \quad [TetR^{free}] \quad in \quad function \quad of \quad [TetR^{total}] := [TetR]$$

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specific to pFlhDC/EnvZ-circuit

$$\begin{matrix}(21)\\(34)\\(42)\end{matrix} \Rightarrow \frac{d[EnvZ]}{dt} = b_{30}[(FlhDC)_{n_5}\bowtie pFlhB]_{eq}+b_{31}[(FliA)_{n_{11}}\bowtie pFlhB]_{eq}-\gamma_{42}[EnvZ] \quad (67a)$$

$$\begin{matrix}(52)\\(53)\end{matrix} \Rightarrow \frac{d[EnvZ]}{dt} = \beta_{30} \cdot \frac{[FlhDC]^{n_5}}{K_5^{n_5} + [FlhDC]^{n_5}} + \beta_{31} \cdot \frac{[FliA]^{n_{11}}}{K_{11}^{n_{11}} + [FliA]^{n_{11}}} - \gamma_{42}[EnvZ] \tag{67b}$$

$$[EnvZ^{total}] = [EnvZ_b] + [EnvZ] \tag{67}$$

Solve then eqn.(57) to get $[OmpR^*]$ *in function of* $[OmpR^{total}] := [OmpR_b]$

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specific to pFlhDC/OmpR*-circuit

$$\begin{matrix}(20)\\(33)\\(43)\end{matrix} \Rightarrow \frac{d[OmpR^*]}{dt} = b_{30}[(FlhDC)_{n_5} \bowtie pFlhB]_{eq} + b_{31}[(FliA)_{n_{11}} \bowtie pFlhB]_{eq} - \gamma_{43}[OmpR^*] \tag{68a}$$

$$\begin{matrix}(52)\\(53)\end{matrix} \Rightarrow \frac{d[OmpR^*]}{dt} = \beta_{30} \cdot \frac{[FlhDC]^{n_5}}{K_5^{n_5} + [FlhDC]^{n_5}} + \beta_{31} \cdot \frac{[FliA]^{n_{11}}}{K_{11}^{n_{11}} + [FliA]^{n_{11}}} - \gamma_{43}[OmpR^*] \tag{68}$$
