Supplementary Table 3:

Equations governing the dynamics of transcription and translation

$$\frac{d}{dt} mRNA_{nuc,i} = v_{ts} - v_{ex} \tag{3.1}$$

$$\frac{d}{dt} mRNA_{cyt,i} = v_{ex} \cdot \frac{V_{nuc}}{V_{cyt}} - v_{rd} - mRNA_{cyt,i} \cdot V_{ratio} \tag{3.2}$$

$$v_{ts} = k_{ts,i} \cdot Hog1P_{2\,nuc} \tag{3.3}$$

$$v_{ex} = k_{ex,i} \cdot mRNA_{nuc,i} \tag{3.4}$$

$$v_{rd} = k_{rd,i} \cdot mRNA_{cyt,i} \tag{3.5}$$

$$\frac{d}{dt} Protein_i = v_{tl} - v_{pd} - Protein_i \cdot V_{ratio} \tag{4.1}$$

$$v_{tl} = k_{tl,i} \cdot mRNA_{cyt,i} \tag{4.2}$$

$$v_{pd} = k_{pd,i} \cdot Protein_i \tag{4.3}$$

(i = 1 – for genes coding for glycolytic enzymes, i = 2 – for genes coding for protein phosphatase)

Parameters

$k_{ts,1} = 0.0005\,\mathrm{s}^{-1}$ $\quad$ $k_{ts,2} = 0.00045\,\mathrm{s}^{-1}$

$k_{ex,1} = 0.0037\,\mathrm{s}^{-1}$ $\quad$ $k_{ex,2} = 0.00005\,\mathrm{s}^{-1}$

$k_{rd,1} = 8.085\,\mathrm{s}^{-1}$ $\quad$ $k_{rd,2} = 0.0937\,\mathrm{s}^{-1}$

$k_{tl,1} = 0.0205\,\mathrm{s}^{-1}$ $\quad$ $k_{tl,2} = 0.00125\,\mathrm{s}^{-1}$

$k_{pd,1} = 0.000125\,\mathrm{s}^{-1}$ $\quad$ $k_{pd,2} = 0.00014\,\mathrm{s}^{-1}$

Initial concentration values

$mRNA^0_{nuc,1} = 4.0 \cdot 10^{-3}\,\mu M$ $\quad$ $mRNA^0_{nuc,2} = 27 \cdot 10^{-2}\,\mu M$

$mRNA^0_{cyt,1} = 1.06 \cdot 10^{-3}\,\mu M$ $\quad$ $mRNA^0_{cyt,2} = 0.2 \cdot 10^{-3}\,\mu M$

$Protein_1^0 = 1.7 \cdot 10^{-6}\ \mu M$ $Protein_2^0 = 1.27 \cdot 10^{-3}\ \mu M$