Notation:

- x_1=$[G6P]$
- x_2=$[G1P]$
- x_3=$[ADPG]$
- x_4=$[ATP]$
- x_5=$[1,4Glucan]$
- x_6=$[Glycogen]$
- x_7=$[PPi]$
- x_s=$[ADP]$

Model:

$$
\begin{aligned}
\dot{x_1} &= -\frac{\mu_1 x_1 - \mu_2 x_2}{1 + \lambda_1 x_1 + \lambda_2 x_2}, \\
\dot{x_2} &= \frac{\mu_1 x_1 - \mu_2 x_2}{1 + \lambda_1 x_1 + \lambda_2 x_2} - \frac{V_{max,3} x_2 x_4}{k_{ma,3} k_{mb,3} + k_{mb,3} x_2 + k_{ma,3} x_4 + x_2 x_4} + k_{1,4} x_6 \\
\dot{x_3} &= -\frac{\mu_3 x_3 - \mu_4 x_5}{1 + \lambda_3 x_3 + \lambda_4 x_5 + \lambda_5 x_s} + \frac{V_{max'3} x_2 x_4}{k_{ma,3} k_{mb,3} + k_{mb,3} x_2 + k_{ma,3} x_4 + x_2 x_4} \\
\dot{x_4} &= -\frac{V_{max,3} x_2 x_4}{k_{ma,3} k_{mb,3} + k_{mb,3} x_2 + k_{ma,3} x_4 + x_2 x_4}, \\
\dot{x_5} &= \frac{\mu_3 x_3 - \mu_4 x_5}{1 + \lambda_3 x_3 + \lambda_4 x_5 + \lambda_5 x_s} - \frac{\mu_5 x_5 - \mu_6 x_6}{1 + \lambda_6 x_5 + \lambda_7 x_6}, \\
\dot{x_6} &= \frac{\mu_5 x_5 - \mu_6 x_6}{1 + \lambda_6 x_5 + \lambda_7 x_6} - k_{1,4} x_6, \\
\dot{x_7} &= \frac{V_{max'3} x_2 x_4}{k_{ma,3} k_{mb,3} + k_{mb,3} x_2 + k_{ma,3} x_4 + x_2 x_4},
\end{aligned}
$$

Where:
- $\mu_1 = \frac{V_{f,Pgm}}{K_{ms,Pgm}}$,
- $\mu_2 = \frac{V_{r,Pgm}}{K_{mp,Pgm}}$,
- $\mu_3 = \frac{V_{f,1}}{K_{ms,1}}$
- $\mu_4 = \frac{V_{r,1}}{K_{mp,1}}$
- $\mu_5 = \frac{V_{f,2}}{K_{ms,2}}$
- $\mu_6 = \frac{V_{r,2}}{K_{mp,2}}$
- $\lambda_1 = \frac{\mu_1}{V_{f,Pgm}}$,
- $\lambda_2 = \frac{\mu_2}{V_{f,Pgm}}$,

- $\lambda_3 = \frac{\mu_3}{V_{f,1}}$
- $\lambda_4 = \frac{\mu_4}{V_{r,1}}$
- $\lambda_5 = \frac{1}{k_i,1}$
- $\lambda_6 = \frac{\mu_5}{V_{f,2}}$
- $\lambda_7 = \frac{\mu_6}{V_{r,2}}$

And:

- $Pgm =$ Phosphoglucomutase
- $GlgA = 1$
- $GlcB = 2$
- $GlgC = 3$
- $GlgX = 4$