

**CoreSBML**  
**Networks/BioModels/curated/B023.xml: Rohwer2001\_Sucrose**  
Presented by BioComputing's Network-Graph Tool

Joaquin Niehren and Cristian Versari  
BioComputing, Inria and Université de Lille, France

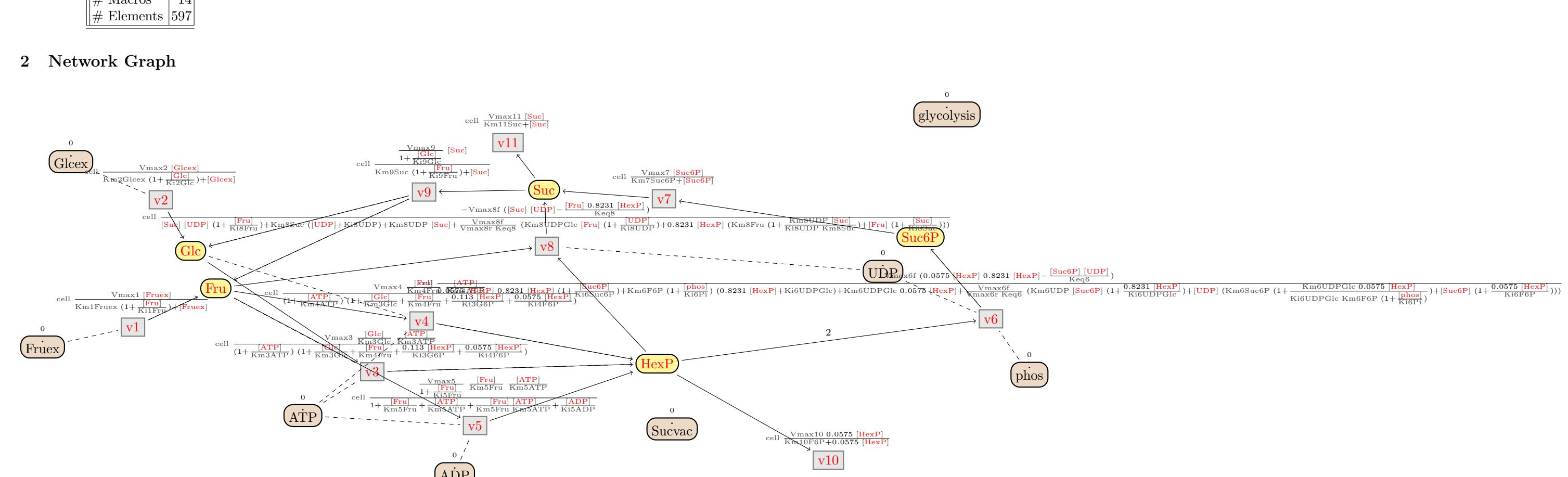
## 1 Reaction Network

Source File: Networks/BioModels/curated/B023.xml from CoreSBML.

Tool: BioComputing's Network-Graph Tool Version 1.99

Application Date: February 21, 2024

## 2 Network Graph



## 3 Initial values

Initial values of species

[Fru]	= 1
[Glc]	= 1
[HexP]	= 1
[Suc6P]	= 1
[Suc]	= 1
[Sucrose]	= 0
[glycolysis]	= 0
[phos]	= 0
[UDP]	= 0
[ADP]	= 0
[ATP]	= 0
[ATP]	= 0
[Glcex]	= 0
[Fruex]	= 0
[cell]	= 1

## 4 Equations over time

Macro definitions

[Fru]	= [v1]
[Glc]	= [v2]
[HexP]	= [v3]
[Suc6P]	= [v4]
[Suc]	= [v5]
[Sucrose]	= [v6]
[glycolysis]	= [v7]
[phos]	= [v8]
[UDP]	= [v9]
[ADP]	= [v10]
[ATP]	= [v11]
[Glcex]	= [v12]
[Fruex]	= [v13]
[cell]	= 1

Algebraic and differential variables

Sucrose = 0
glycolysis = 0
phos = 0
UDP = 0
ADP = 0
ATP = 0
Glcex = 0
Fruex = 0

### Kinetic laws of reactions

$v1 = \text{cell} \frac{V_{\text{max1}} [\text{Fruex}]}{K_{\text{m1}}[\text{Fruex}] + [\text{Fruex}]} \text{ where } \begin{cases} V_{\text{max1}} = 0.296 \\ K_{\text{m1}}[\text{Fruex}] = 0.2 \\ K_{11}\text{Fru} = 1 \\ V_{\text{max2}} = 0.296 \end{cases}$	$v2 = \text{cell} \frac{V_{\text{max2}} [\text{Glcex}]}{K_{\text{m2}}[\text{Glcex}] + [\text{Glcex}]} \text{ where } \begin{cases} V_{\text{max2}} = 0.197 \\ K_{\text{m2}}[\text{Glcex}] = 1 \\ K_{20}\text{Glc} = 1 \end{cases}$
$v3 = \text{cell} \frac{V_{\text{max3}} \frac{[\text{ATP}]}{K_{\text{m3}}[\text{ATP}]}}{(1 + \frac{[\text{ATP}]}{K_{\text{m3}}[\text{ATP}]}) (1 + \frac{[\text{Glc6P}]}{K_{\text{m3}}[\text{Glc6P}]} + \frac{[\text{Fru6P}]}{K_{\text{m3}}[\text{Fru6P}]} + \frac{[\text{Suc6P}]}{K_{\text{m3}}[\text{Suc6P}]})} \text{ where } \begin{cases} V_{\text{max3}} = 0.197 \\ K_{\text{m3}}[\text{Glc6P}] = 0.07 \\ K_{\text{m3}}[\text{ATP}] = 0.25 \\ K_{15}\text{ATP} = 10 \\ K_{3}\text{Glc6P} = 0.1 \\ K_{4}\text{Glc6P} = 10 \\ V_{\text{max4}} = 0.097 \\ K_{\text{m4}}[\text{ATP}] = 10 \\ K_{15}\text{ATP} = 10 \\ K_{\text{m4}}[\text{Glc6P}] = 0.25 \end{cases}$	$v4 = \text{cell} \frac{V_{\text{max4}} \frac{[\text{ATP}]}{K_{\text{m4}}[\text{ATP}]}}{(1 + \frac{[\text{ATP}]}{K_{\text{m4}}[\text{ATP}]}) (1 + \frac{[\text{Glc6P}]}{K_{\text{m4}}[\text{Glc6P}]} + \frac{[\text{Fru6P}]}{K_{\text{m4}}[\text{Fru6P}]} + \frac{[\text{Suc6P}]}{K_{\text{m4}}[\text{Suc6P}]})} \text{ where } \begin{cases} V_{\text{max4}} = 0.164 \\ K_{\text{m4}}[\text{Glc6P}] = 0.07 \\ K_{\text{m4}}[\text{ATP}] = 0.25 \\ K_{15}\text{ATP} = 10 \\ K_{3}\text{Glc6P} = 0.1 \\ K_{4}\text{Glc6P} = 10 \end{cases}$
$v5 = \text{cell} \frac{V_{\text{max5}} \frac{[\text{ATP}]}{K_{\text{m5}}[\text{ATP}]}}{(1 + \frac{[\text{ATP}]}{K_{\text{m5}}[\text{ATP}]}) (1 + \frac{[\text{GlcNAc}]}{K_{\text{m5}}[\text{GlcNAc}]} + \frac{[\text{FruNAc}]}{K_{\text{m5}}[\text{FruNAc}]} + \frac{[\text{SucNAc}]}{K_{\text{m5}}[\text{SucNAc}]})} \text{ where } \begin{cases} V_{\text{max5}} = 0.164 \\ K_{\text{m5}}[\text{ATP}] = 12 \\ K_{\text{m5}}[\text{GlcNAc}] = 0.1 \\ K_{\text{m5}}[\text{FruNAc}] = 0.085 \\ K_{\text{m5}}[\text{SucNAc}] = 2 \end{cases}$	$v6 = \text{cell} \frac{V_{\text{max6}} (0.0575 [\text{HexP}] 0.8231 [\text{HexP}] - \frac{[\text{HexP}]}{K_{\text{m6}}[\text{HexP}]})}{(0.8231 [\text{HexP}] + \text{K}_{\text{m6}}[\text{UDPGlc}]) 0.0575 [\text{HexP}] + \frac{V_{\text{max6}} (0.0575 [\text{HexP}] 0.8231 [\text{HexP}] - \frac{[\text{HexP}]}{K_{\text{m6}}[\text{HexP}]})}{(0.8231 [\text{HexP}] + \text{K}_{\text{m6}}[\text{UDPGlc}]) 0.0575 [\text{HexP}] + \frac{V_{\text{max6}} (0.0575 [\text{HexP}] 0.8231 [\text{HexP}] - \frac{[\text{HexP}]}{K_{\text{m6}}[\text{HexP}]})}{(0.8231 [\text{HexP}] + \text{K}_{\text{m6}}[\text{UDPGlc}]) 0.0575 [\text{HexP}] + \frac{V_{\text{max6}} (0.0575 [\text{HexP}] 0.8231 [\text{HexP}] - \frac{[\text{HexP}]}{K_{\text{m6}}[\text{HexP}]})}{(0.8231 [\text{HexP}] + \text{K}_{\text{m6}}[\text{UDPGlc}]) 0.0575 [\text{HexP}]})} \text{ where } \begin{cases} V_{\text{max6}} = 0.379 \\ K_{\text{m6}}[\text{HexP}] = 10 \\ K_{\text{m6}}[\text{Suc6P}] = 0.07 \\ K_{\text{m6}}[\text{F6P}] = 0.6 \\ K_{\text{m6}}[\text{Pi}] = 3 \\ K_{\text{m6}}[\text{ATP}] = 1.4 \\ K_{\text{m6}}[\text{UDPGlc}] = 1.8 \\ V_{\text{max7}} = 0.2 \\ K_{\text{m7}}[\text{ATP}] = 0.3 \\ K_{\text{m7}}[\text{Suc6P}] = 0.1 \\ K_{\text{m7}}[\text{F6P}] = 0.4 \end{cases}$
$v7 = \text{cell} \frac{V_{\text{max7}} [\text{Suc6P}]}{K_{\text{m7}}[\text{Suc6P}]} \text{ where } \begin{cases} V_{\text{max7}} = 0.5 \\ K_{\text{m7}}[\text{Suc6P}] = 0.1 \end{cases}$	$v8 = \text{cell} \frac{-V_{\text{max8}} ([\text{UDP}] - \frac{[\text{UDP}]}{K_{\text{m8}}[\text{UDP}]})}{([\text{UDP}] (1 + \frac{[\text{UDP}]}{K_{\text{m8}}[\text{UDP}]}) + \text{K}_{\text{m8}}[\text{UDP}] [\text{Suc6P}] + \text{K}_{\text{m8}}[\text{UDP}] [\text{Suc}])} \text{ where } \begin{cases} V_{\text{max8}} = 0.377 \\ K_{\text{m8}}[\text{UDP}] = 0.3 \\ K_{\text{m8}}[\text{Suc6P}] = 0.07 \\ K_{\text{m8}}[\text{F6P}] = 0.6 \\ K_{\text{m8}}[\text{Pi}] = 3 \\ K_{\text{m8}}[\text{ATP}] = 1.4 \\ K_{\text{m8}}[\text{UDPGlc}] = 1.8 \\ V_{\text{max9}} = 0.677 \\ K_{\text{m9}}[\text{Glc6P}] = 5 \\ K_{\text{m9}}[\text{Fru6P}] = 4 \\ K_{\text{m9}}[\text{Suc6P}] = 50 \\ K_{\text{m9}}[\text{ATP}] = 0 \\ K_{\text{m9}}[\text{UDPGlc}] = 0.3 \\ K_{\text{m9}}[\text{F6P}] = 0.3 \\ K_{\text{m9}}[\text{Pi}] = 0 \\ K_{\text{m9}}[\text{ATP}] = 1.4 \\ K_{\text{m9}}[\text{UDPGlc}] = 1.8 \\ V_{\text{max10}} = 0.0575 [\text{HexP}] \text{ where } \begin{cases} V_{\text{max10}} = 0.1 \\ K_{\text{m10}}[\text{HexP}] = 0.2 \end{cases}$
$v10 = \text{cell} \frac{V_{\text{max10}} 0.0575 [\text{HexP}]}{K_{\text{m10}}[\text{HexP}]} \text{ where } \begin{cases} V_{\text{max10}} = 0.1 \\ K_{\text{m10}}[\text{HexP}] = 0.2 \end{cases}$	$v11 = \text{cell} \frac{V_{\text{max11}} [\text{Suc}]}{K_{\text{m11}}[\text{Suc}]} \text{ where } \begin{cases} V_{\text{max11}} = 1 \\ K_{\text{m11}}[\text{Suc}] = 100 \end{cases}$

### Differential equations of species

$\dot{Fru} = v1 - v2 - v5 + v8 + v9$
$\dot{Glc} = v2 - v3 + v4 + v9$
$\dot{HexP} = v3 + v4 + v5 - 2v6 - v8 - v10$
$\dot{Suc6P} = v6 - v7$
$\dot{Suc} = v7 + v8 - v9 - v11$