

1 Reaction Network pyruvate

Graph, ODEs and Steady State Equations

1.1 Parameters

Reaction Network. See file: `Network/pyruvate.xml`

See Figure [1](#).

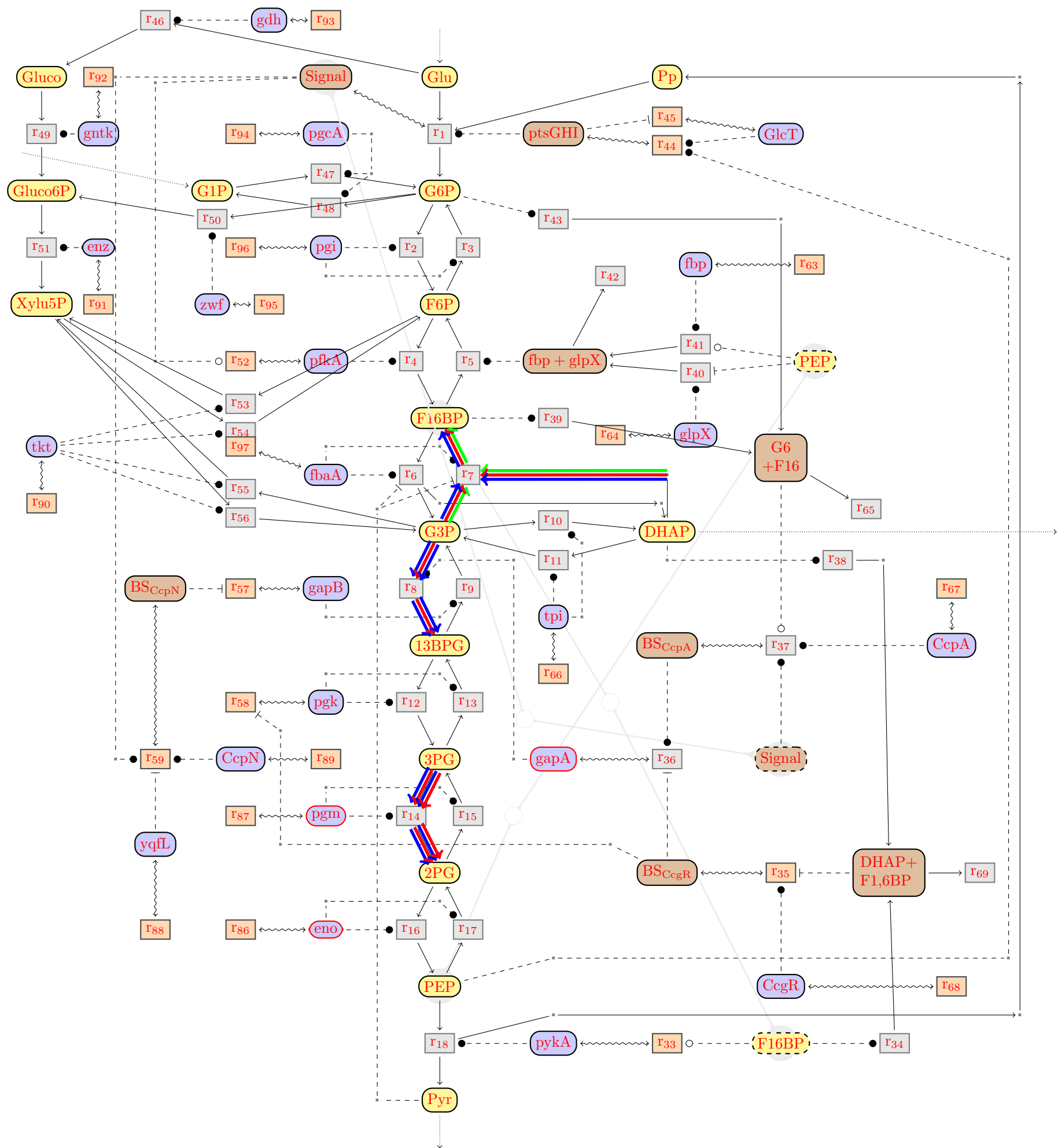


Fig. 1. The pyruvate/Test.

Role	Short name	Chemical Species
Metabolites	Glu	Glucose
	G1P	Glucose-1-Phosphate
	G6P	Glucose-6-Phosphate
	F6P	Fructose-6-Phosphate
	F16BP	Fructose-1,6-Biphosphate
	G3P	Glyceraldehyde-3-Phosphate
	13BPG	1,3-Bisphosphoglycerate
	3PG	3-Phosphoglycerate
	2PG	2-Phosphoglycerate
	PEP	Phosphoenolpyruvate
	Pyr	Pyruvate
	DHAP	Dihydroxyacetonephosphate
	Pp	PyroPhosphate
	Gluco	Gluconate
	Gluco6P	Glucose-6-P
	Xylu5P	Xylulose-5-P
Proteines	GlcT	Transcriptional antiterminator.
	pgi	Glu-6-Phosphate isomerase.
	pfkA	Phosphofructokinase.
	fbpA	Fructose-1,6-biphosphate aldolase
	gapB	Glyceraldehyde-phosphatedehydrogenase
	pgk	Phosphoglycerate kinase
	pgm	2,3-Biphosphoglycerate - Independent phosphoglycerate mutase
	eno	Enolase
	pykA	Pyruvate kinase
	tpi	Triose phosphate isomerase
	gapA	Glyceraldehyde-3-phosphate dehydrogenase
	CcgR	Transcriptional repressor
	CcpN	Transcriptional repressor
	yqfL	Positive regulator
	fbp	Fructose-1,6-biphosphatase class III
	glpX	Fructose-1,6-biphosphatase class II
	pgcA	α -phosphoglucomutase
	gdh	Glucose 1-deshydrogenase
	gntk	Gluconokinase
	enz	??
	tkt	Transketolase
	zwf	Glucose-6-phosphate 1-dehydrogenase
	CcpA	Transcriptional activator
Actors	ptsGHI	Composed by ptsG, ptsH and ptsI
	fbp + glpX	Activity of fbp and glpX
	DHAP+ F1,6BP	Activity of G6P, DHAP, F6P and F16BP
	G6 +F16	Activity of G6P and FOneSixBP
	BS_{CcpA}	Activity of CcpA binding to gapA
	BS_{CcgR}	Activity of CcgR binding to gapA
	BS_{CcpN}	Activity of CcpN binding to gapB
	Signal	Signal generated by the phosphorylation of Glu to G6P

Fig. 2. Molecules of pyruvate/Test.

Name	Function
r ₁	Phosphorylation of Glu
r _{1'}	degradation of Signal
r ₂	Catalyse the conversion of G6P to F6P
r ₃	Catalyse the conversion of F6P to G6P ?
r ₄	Catalyse the conversion of F6P to F16BP
r ₅	Catalyse the conversion of F16BP to F6P
r ₆	Conversion of F16BP to G3P
r ₇	Conversion of G3P to F16BP
r ₈	Catalyse the conversion of G3P to 13BPG
r ₉	Catalyse the conversion of 13BPG to G3P
r ₁₀	Catalyse the conversion of G3P to DHAP
r ₁₁	Catalyse the conversion of DHAP to G3P
r ₁₂	Catalyse the conversion of 13BPG to 3PG
r ₁₃	Catalyse the conversion of 3PG to 13BPG
r ₁₄	Catalyse the conversion of 3PG to 2PG
r ₁₅	Catalyse the conversion of 2PG to 3PG
r ₁₆	Catalyse the conversion of 2PG to PEP
r ₁₇	Catalyse the conversion of PEP to 2PG
r ₁₈	Catalyse the conversion of PEP to Pyr
r ₃₃	expression of pykA
r _{1'}	degradation of pykA
r ₃₄	Express F16BP
r ₃₅	Bind CcgR to gapA for inhibition
r _{1'}	degradation of BS _{CcgR}
r ₃₆	Regulation of gapA activity, activation by CcpA and inhibition by CcgR
r _{1'}	degradation of gapA
r ₃₇	Bind CcpA to gapA for activation
r _{1'}	degradation of BS _{CcpA}
r ₃₈	Express DHAP
r ₃₉	Expression of F16BP
r ₄₀	Express glpX
r ₄₁	Express fbp
r ₄₂	degradation of fbp + glpX
r ₄₃	Express G6P
r ₄₄	Activation of GlcT activity
r _{1'}	degradation of ptsGHI
r ₄₅	Inhibition of GlcT activity by pstGHI
r _{1'}	degradation of GlcT
r ₄₆	Production of Glu throw Gluco
r ₄₇	Catalyse the conversion of G1P to G6P
r ₄₈	Catalyse the conversion of G6P to G1P
r ₄₉	Production of Gluco throw Gluco6P
r ₅₀	Production of G6P throw Gluco6P
r ₅₁	Production of Xylu5P throw Gluco6P
r ₅₂	expression of pfkA
r _{1'}	degradation of pfkA
r ₅₃	Production of Xylu5P throw F6P
r ₅₄	Production of Xylu5P throw F6P
r ₅₅	Production of G3P throw Xylu5P
r ₅₆	Production of Xylu5P throw G3P
r ₅₇	Expression of gapB
r _{1'}	degradation of gapB
r ₅₈	expression of pgk
r _{1'}	degradation of pgk
r ₅₉	Bind CcpN to gapB for inhibition
r _{1'}	degradation of BS _{CcpN}
r ₆₃	expression of fbp
r _{1'}	degradation of fbp
r ₆₄	expression of glpX
r _{1'}	degradation of glpX
r ₆₅	degradation of G6 +F16
r ₆₆	degradation of tpi
r _{1'}	degradation of tpi
r ₆₇	expression of CcpA
r _{1'}	degradation of CcpA
r ₆₈	expression of CcgR

r _{1'}	degradation of CcgR
r ₆₉	degradation of G6P + DH + F2
r ₈₆	expression of eno
r _{1'}	degradation of eno
r ₈₇	expression of pgm
r _{1'}	degradation of pgm
r ₈₈	degradation of yqfL
r _{1'}	degradation of yqfL
r ₈₉	expression of CcpN
r _{1'}	degradation of CcpN
r ₉₀	degradation of tkt
r _{1'}	degradation of tkt
r ₉₁	degradation of enz
r _{1'}	degradation of enz
r ₉₂	degradation of gntk
r _{1'}	degradation of gntk
r ₉₃	degradation of gdh
r _{1'}	degradation of gdh
r ₉₄	expression of pgcA
r _{1'}	degradation of pgcA
r ₉₅	degradation of zwf
r _{1'}	degradation of zwf
r ₉₆	expression of pgi
r _{1'}	degradation of pgi
r ₉₇	expression of fbaA
r _{1'}	degradation of fbaA

Fig. 3. Reactions of pyruvate/Test

1.2 What Else

Comments to be treated A small FAQ

Question 1. Are r40 r41 candidates for KO ?

Question 2. Define Signal real name

Question 3. Do we add G1P outflow ? do we remove the inflow ? is pgcA an Accelerator ?

Question 4. Precision for CcpA from Tobish 1999?

Question 5. Repression of CodY by Val-Leu (r71)? (cf Carbon Catabolic Control of the Metabolic Network in B. Subtilis)

Question 6. Repression of production of Malate throw TCA by CcpA (r24)? (cf Positive regulation of B. Subtilis by CodY ...)

Question 7. Ilv actor meaning ?