

# BioComputing's Network-Graph Tool

## Version 0.99

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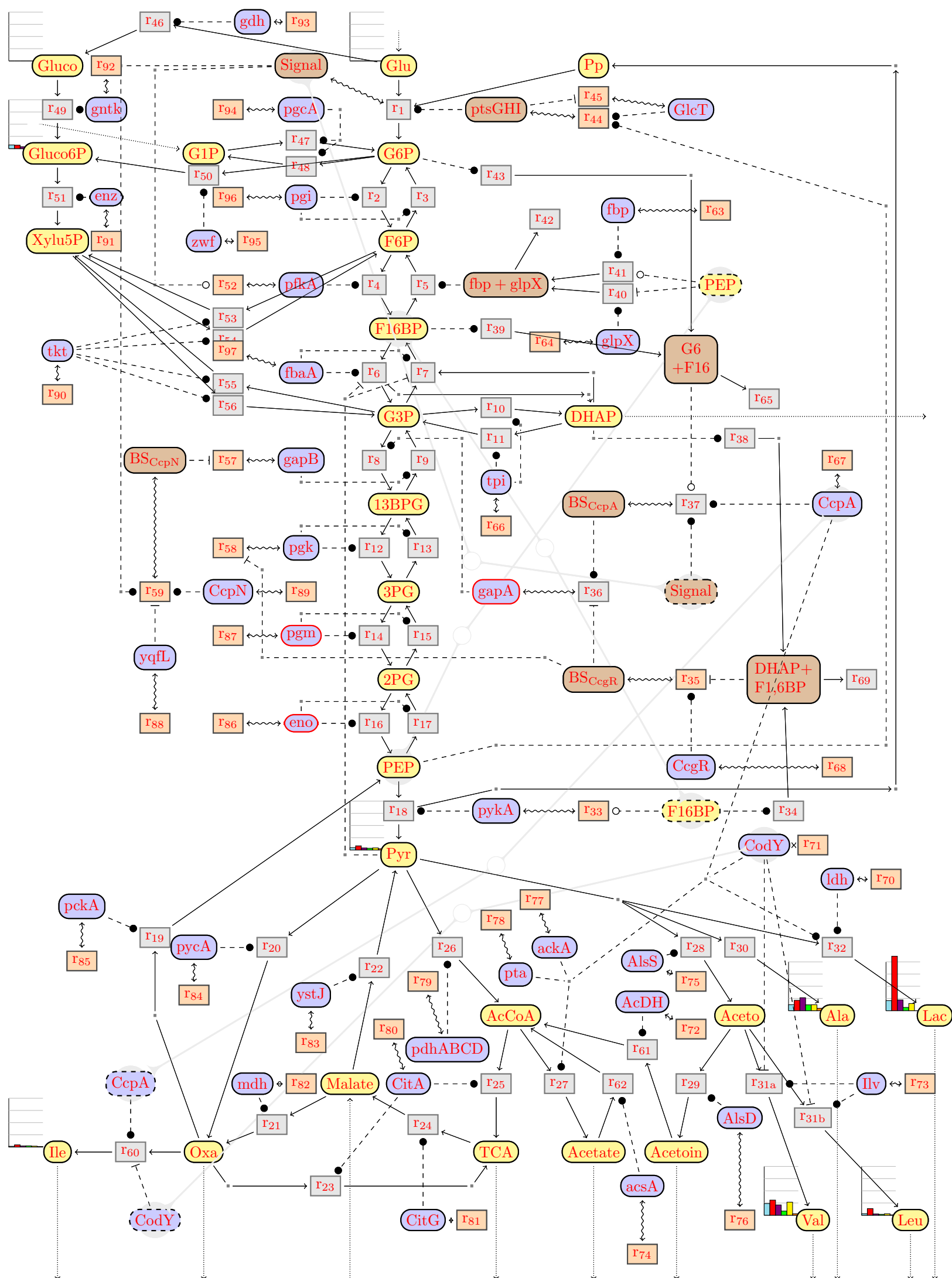
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### 1 Reaction Network Networks/pyruvate-krebs.xml

*Reaction Network.* See file: [Networks/pyruvate-krebs.xml](#) See Figure [1](#).

*Analysis* See charts: [means-native-6h](#)







**Fig. 1.** The Networks/pyruvate-krebs.xml.

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



r66'	degradation of tpi
r67	expression of CcpA
r67'	degradation of CcpA
r68	expression of CcgR
r68'	degradation of CcgR
r69	degradation of G6P + DH + F2
r86	expression of eno
r86'	degradation of eno
r87	expression of pgm
r87'	degradation of pgm
r88	degradation of yqfL
r88'	degradation of yqfL
r89	expression of CcpN
r89'	degradation of CcpN
r90	degradation of tkt
r90'	degradation of tkt
r91	degradation of enz
r91'	degradation of enz
r92	degradation of gntk
r92'	degradation of gntk
r93	degradation of gdh
r93'	degradation of gdh
r94	expression of pgcA
r94'	degradation of pgcA
r95	degradation of zwf
r95'	degradation of zwf
r96	expression of pgi
r96'	degradation of pgi
r97	expression of fbaA
r97'	degradation of fbaA
r20	Production of Acetoin throw Pyr
r21	Production of Oxa throw Malate
r22	Production of Pyr throw Malate
r23	Production of TCA throw Oxa
r24	Production of Malate throw TCA
r25	Turn to TCA throw AcCoA
r26	Production of AcCoA throw Pyr
r27	Production of Acetate throw AcCoA
r28	Production of Aceto throw Pyr
r29	Production of Acetoin throw Aceto
r30	Production of Alanine throw Pyr
r31a	Production of Val throw Aceto
r31b	Production of Leu throw Aceto
r32	Production of Lac throw Pyr
r60	Production of Ile throw Oxa
r61	Production of AcCoA throw Acetoin
r62	Production of AcCoA throw Acetate
r70	expression of ldh
r70'	degradation of ldh
r71	expression of CodY
r71'	degradation of CodY
r72	expression of AcDH
r72'	degradation of AcDH
r73	degradation of Ilv
r73'	degradation of Ilv
r74	expression of acsA
r74'	degradation of acsA
r75	expression of AlsS
r75'	degradation of AlsS
r76	expression of eno
r76'	degradation of AlsD
r77	expression of ackA
r77'	degradation of ackA
r78	expression of pta
r78'	degradation of pta
r79	expression of pdhABCD
r79'	degradation of pdhABCD
r80	expression of CitA
r80'	degradation of CitA



r81	expression of CitG
r81'	degradation of CitG
r82	expression of mdh
r82'	degradation of mdh
r83	expression of ystJ
r83'	degradation of ystJ
r84	expression of pycA
r84'	degradation of pycA
r85	expression of pckA
r85'	degradation of pckA
r19	feedback reaction to PEP from Oxa

**Fig. 3.** Reactions of Networks/pyruvate-krebs.xml

### 1.1 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 ?

A small FAQ



Role	Short name	Chemical Species
Metabolites	<b>Glu</b>	Glucose
	<b>G1P</b>	Glucose-1-Phosphate
	<b>G6P</b>	Glucose-6-Phosphate
	<b>F6P</b>	Fructose-6-Phosphate
	<b>F16BP</b>	Fructose-1,6-Biphosphate
	<b>G3P</b>	Glyceraldehyde-3-Phosphate
	<b>13BPG</b>	1,3-Bisphosphoglycerate
	<b>3PG</b>	3-Phosphoglycerate
	<b>2PG</b>	2-Phosphoglycerate
	<b>PEP</b>	Phosphoenolpyruvate
	<b>Pyr</b>	Pyruvate
	<b>DHAP</b>	Dihydroxyacetonphosphate
	<b>Pp</b>	PyroPhosphate
	<b>Gluco</b>	Gluconate
	<b>Gluco6P</b>	Glucose-6-P
	<b>Xylu5P</b>	Xylulose-5-P
	<b>TCA</b>	Krebbs cycle
	<b>Acetoin</b>	Acetoin
	<b>Acetate</b>	Acetate
	<b>Aceto</b>	Aceto
	<b>Ala</b>	Alanine
	<b>Lac</b>	Lactate
	<b>Val</b>	Valine
	<b>Leu</b>	Leucine
	<b>Ile</b>	Isoleucine
	<b>AcCoA</b>	Acetyl CoA
	<b>Oxa</b>	Oxaloacetate
	<b>Malate</b>	Malate
Proteines	<b>GlcT</b>	Transcriptional antiterminator.
	<b>pgi</b>	Glu-6-Phosphate isomerase.
	<b>pfkA</b>	Phosphofructokinase.
	<b>fbaA</b>	Fructose-1,6-biphosphate aldolase
	<b>gapB</b>	Glyceraldehyde-phosphatedehydrogenase
	<b>pgk</b>	Phosphoglycerate kinase
	<b>pgm</b>	2,3-Bisphosphoglycerate - Independent phosphoglycerate mutase
	<b>eno</b>	Enolase
	<b>pykA</b>	Pyruvate kinase
	<b>tpi</b>	Triose phosphate isomerase
	<b>gapA</b>	Glyceraldehyde-3-phosphate dehydrogenase
	<b>CcgR</b>	Transcritpional repressor
	<b>CcpN</b>	Transcriptional repressor
	<b>yqfL</b>	Positive regulator
	<b>fbp</b>	Fructose-1,6-biphosphatase class III
	<b>glpX</b>	Fructose-1,6-biphosphatase class II
	<b>pgcA</b>	$\alpha$ -phosphoglucomutase
	<b>gdh</b>	Glucose 1-deshydrogenase
	<b>gntk</b>	Gluconokinase
	<b>enz</b>	??
	<b>tkt</b>	Transketolase
	<b>zwf</b>	Glucose-6-phosphate 1-dehydrogenase
	<b>CcpA</b>	Transcriptional activator
	<b>pdhABCD</b>	Pyruvate dAlshydrogenase
	<b>ystJ</b>	Enzyme malique
	<b>CitA</b>	Citrate synthase
	<b>CitG</b>	Fumarase
	<b>mdh</b>	Malate deshydrogenase
	<b>pckA</b>	Phosphoenolpyruvate carboxykinase
	<b>pycA</b>	Pyruvate carboxylase
	<b>ackA</b>	Acetate kinase
	<b>pta</b>	Phosphotransacetylase
	<b>AcDH</b>	Acetoin deshydrogenase
	<b>acsA</b>	Acetyl CoA synthetase
	<b>AlsS</b>	$\alpha$ -acetolactate synthetase
	<b>AlsD</b>	$\alpha$ -acetolactate-dehydrogenase
	<b>Ilv</b>	?
	<b>ldh</b>	Lactate dehydrogenase
	<b>CodY</b>	Transcriptional pleiotropic regulator
Actors	<b>ptsGHI</b>	Composed by ptsG, ptsH and ptsI
	<b>fbp + glpX</b>	Activity of fbp and glpX
	<b>DHAP+ F1,6BP</b>	Activity of G6P, DHAP, F6P and F16BP
	<b>G6 +F16</b>	Activity of <b>G6P</b> and <b>FOneSixBP</b>
	<b>BS<sub>CcpA</sub></b>	Activity of <b>CcpA</b> binding to <b>gapA</b>
	<b>BS<sub>CcgR</sub></b>	Activity of <b>CcgR</b> binding to <b>gapA</b>
	<b>BS<sub>CcpN</sub></b>	Activity of <b>CcpN</b> binding to <b>gapB</b>
	<b>Signal</b>	Signal generated by the phosphorylation of <b>Glu</b> to <b>G6P</b>

**Fig. 2.** Molecules of Networks/pyruvate-krebs.xml.