# Supplementary file 1 A: Model equations

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| --- | --- | --- | --- |
| **Reaction nr** | **reaction** | **Function** | **Present in model(s)** |
| 1 PTS\_Glc  Glucose proton symporter | GLC\_Ext + PEP -> G6P + PYR; FBP Pi\_Int | A screenshot of a cell phone  Description automatically generated | 1,2,3,4,5,6 |
| 2 PGI  Glucose-6-phosphate isomerase | G6P = F6P | A screenshot of a cell phone  Description automatically generated | 1,2,3,4,5,6 |
| 3 PFK Phosphofructokinase | F6P + ATP ->  FBP + ADP | A picture containing wall  Description automatically generated | 1,2,3,4,5,6 |
| 4 FBA  Fructose-bisphosphate aldolase | GAP + Pi\_Int + NAD = DGP + NADH | Table  Description automatically generated with low confidence | 1,2,3,4,5,6 |
| 5 GAPDH  Glyceraldehyde-3-phosphate dehydrogenase | DGP + ADP = PEP + ATP |  | 1,2,3,4,5,6 |
| 6 ENO  Enolase | PEP + ADP -> PYR + ATP; FBP Pi\_Int | Diagram  Description automatically generated | 1,2,3,4,5,6 |
| 7 PYK  Pyruvate kinase | PYR + CoA + NAD = AcCoA + NADH; GAP | A screenshot of a cell phone  Description automatically generated | 1,2,3,4,5,6 |
| 8 LDH  Lactate dehydrogenase | PYR + NADH -> LAC + NAD; FBP Pi\_Int\* O2 | A picture containing diagram  Description automatically generated | 1\*,2\*,3\*,4\*,5,6 |
| 9 PDH  Pyruvate dehydrogenase | PYR + CoA + NAD = AcCoA + NADH; GAP | A screenshot of a cell phone  Description automatically generated | 1,2,3,4,5,6 |
| 10 PTA\_ACK  Phosphotransacetylase | AcCoA + ADP -> ACE + ATP + CoA | A screenshot of a cell phone  Description automatically generated | 1,2,3,4,5,6 |
| 11 ATPase | ATP -> ADP + Pi\_Int | A screenshot of a cell phone  Description automatically generated | 2,4,6 |
| 12 NOXE  NADH oxidase | O2 + 2 \* NADH -> 2 \* NAD | A close up of a sign  Description automatically generated | 3,4,6 |

\*Models marked with an asterisk contain the function for Lactate Dehydrogenase without the oxygen inhibition term

# Supplementary file 1 B comparison of model additions

Figure Zoomed in version of comparison of 100 parameter sets for the model with and without additions. Outliers on the top were removed to better show overall performance of the models.

Chart

Description automatically generated

Figure Correlation of the parameter sets for model 3 that includes NoxE for the best 10 performing parameter sets.

Parameter distributions for each of the 6 models over 100 parameter sets as well as heatmaps showing the correlation between parameters over all 100 fittings for each of the six model configurations are available upon request.

# Supplementary file 1 C Simulating 40 independent samples.

Metabolite concentrations measured and predicted using a 1000x sampling.

Diagram

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# Supplementary file 1 D Metabolomics analysis.

A picture containing diagram

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Figure Local sensitivity analysis using 1000x sampling from the measurement distribution.

A picture containing chart

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Figure Global sensitivity analysis using a 100,000 Latin Hypercube sampling withing the parameter search range.

Chart

Description automatically generated

Figure Correlation analysis of control coefficients control over flux through glycolysis using a 100,000 Latin Hypercube sampling.