

Table S4. Unknown Mutant Reaction Turnover Numbers. Empty entries indicate unmodified parameters.

Name	Reaction	k_{cat} (s^{-1})	
		Wild-Type	Mutant
Acetate kinase	$AcP + ADP \leftrightarrow Ac + ATP$	100.59	53.15
Cytidylate kinase	$ATP + CMP \leftrightarrow ADP + CDP$	103.25	8.00
Enolase	$G2P \leftrightarrow H_2O + Pep$	300.87	573.46
Fructose-bisphosphate aldolase	$Fdp \leftrightarrow DHAP + GAP$	23.34	26.06
Glucose-6-phosphate isomerase	$G6P \leftrightarrow F6P$	1218.79	245.80
Methionine adenosyltransferase	$ATP + H_2O + Met \rightarrow AdoMet + Pi + PPI$	0.11	0.06
Phosphotransacetylase	$Ac-CoA + Pi \leftrightarrow AcP + CoA$	1620.91	146.41
Pyruvate dehydrogenase	$CoA + NAD + Pyr \leftrightarrow Ac-CoA + CO_2 + NADH$	1128.31	456.00
Thiamine kinase	$ATP + dTMP \leftrightarrow ADP + dTDP$	0.07	
Triose-phosphate isomerase	$DHAP \leftrightarrow GAP$	816.67	53.65