

Supplementary Table S2. List of 102 reaction pairs identified by damage analysis

Predition number	Redundant reactions	Genes	Metabolites predicted to be affected
1	RIB5PISOM-RXN TRANSALDOL-RXN	STM3063 (<i>rpiA</i>), STM1933 (<i>yedJ</i>) STM4109 (<i>talC</i>), STM2473 (<i>talA</i>), STM0007 (<i>talB</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, lps, dGTP
2	PGLYCDEHYDROG-RXN GLYOHMETRANS-RXN	STM3062 (<i>serA</i>) STM2555 (<i>glyA</i>)	Phosphatidylethanolamine, Ser, Trp, Phosphatidylserin
3	GART-RXN GARTRANSFORMYL2-RXN	STM2500 (<i>purN</i>) STM1883 (<i>purT</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, nadp, dATP, fad, nadph, gtp, amp, atp, dGTP
4	DURIDKI-RXN DUTP-PYROP-RXN	STM1750 (<i>tdk</i>) STM3731 (<i>dut</i>)	dTTP
5	ACETYLGLUTKIN-RXN 3.5.2.14-RXN	STM4122(<i>argB</i>)	Putrescine, Spermidine
6	RIB5PISOM-RXN RIBULP3EPIM-RXN	STM3063 (<i>rpiA</i>), STM1933 (hypothetical protein) STM1617 (epimerase), STM4080 (epimerase), STM3483 (<i>rpe</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
7	ACETYLGLUTKIN-RXN CREATININE-DEAMINASE-RXN	STM4122 (<i>argB</i>) STM3334 (cytocine deaminase)	Putrescine, Spermidine
8	INOPHOSPHOR-RXN PRPPSYN-RXN	STM1780 (<i>prsA</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, dGTP
9	RXN-7968-(NAD) SHIKIMATE-5-DEHYDROGENASE-RXN	STM1359 (<i>aroE</i>) STM1359 (<i>aroE</i>), STM3401 (<i>aroE</i>), STM3859 (<i>aroE</i>)	Mthf, Phe, Tyr, Trp
10	ACETYLORNTRANSAM-RXN CREATINASE-RXN	STM3468 (<i>argD</i>)	Putrescine, Spermidine

11	AGMATIN-RXN ORNDECARBOX-RXN	STM3078 (<i>speB</i>) STM0701 (<i>speF</i>), STM3114 (<i>speC</i>)	Putrescine, Spermidine
12	RIB5PISOM-RXN 2TRANSKETO-RXN	STM3063 (<i>rpiA</i>), STM1933 (hypothetical protein) STM2340 (transketolase), STM2341 (transketolase), STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
13	QUINOLINATE-SYNTHE-MULTI-RXN QUINOLINATE-SYNTHA-RXN	STM0756 (<i>nadA</i>) STM0756 (<i>nadA</i>)	nadh, nad, nadp, nadph
14	THRESYN-RXN AKBLIG-RXN	STM0004 (<i>thrC</i>) STM3709 (<i>tbl</i>)	Ile, Thr
15	ADENYL-KIN-RXN INOSINEKIN-RXN	STM0488 (<i>adk</i>) STM0491 (<i>gsk</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, Asn, nadp, UDP-Glucose, dATP, fad, Cys, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, Met, dGTP
16	RXN0-5114 GLYOHMETRANS-RXN	STM2197 (phosphoserine-phosfortase), STM4578 (<i>serB</i>) STM2555 (<i>glyA</i>)	Phosphatidylethanolamine, Ser, Trp, Phosphatidylserin
17	AKBLIG-RXN HOMOSERKIN-RXN	STM3709 (<i>tbl</i>) STM0003 (<i>thrB</i>)	Ile, Thr
18	1TRANSKETO-RXN RIBULP3EPIM-RXN	STM2340 (transketolase), STM2341 (transketolase), STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>) STM1617 (epimerase), STM4080 (epimerase), STM3483 (<i>rpe</i>)	Mthf, Phe, Tyr, Trp, lps
19	RXN-10639 PHOSPHOGLUCMUT-RXN	STM2820 (<i>ygaBk</i>), STM0698 (<i>pgm</i>)	Star, UDP-Glucose, lps
20	1TRANSKETO-RXN	STM2340 (transketolase), STM2341 (transketolase),	Mthf, Phe, Tyr, Trp, lps

	2TRANSKETO-RXN	STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>) STM2340 (transketolase), STM2341 (transketolase), STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>)	
21	LCYSDESULF-RXN ACSERLY-RXN	STM2430 (transketolase), STM2440 (<i>cysM</i>)	Succoa, Coa, AcCoA, Cys, Spermidine, Met
22	ARGDECARBOX-RXN ORNDECARBOX-RXN	STM4296 (<i>adi</i>), STM3086 (<i>speA</i>) STM0701, STM3114	Putrescine, Spermidine
23	F16BDEPHOS-RXN Glc_tx	STM4415 (<i>fbp</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, Star, His, nadp, Peptidoglycan, UDP- Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
24	ACETYLGLUTKIN-RXN CREATINASE-RXN	STM4122 (<i>argB</i>)	Putrescine, Spermidine
25	RIB5PISOM-RXN RXN-3341	STM3063 (<i>rpiA</i>), STM1933 (hypothetical protein) STM2081 (<i>gnd</i>), STM2083 (<i>rfbK</i>), STM2084 (<i>rfbM</i>), STM2091 (<i>rfbG</i>), STM2092 (<i>rfbF</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP- Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
26	RIB5PISOM-RXN KDPGALDOL-RXN	STM3063 (<i>rpiA</i>), STM1933 (hypothetical protein) STM1884 (<i>eda</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP- Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
27	ORNDECARBOX-RXN CREATININASE-RXN	STM0701 (<i>speF</i>), STM3114 (<i>speC</i>)	Putrescine, Spermidine
28	INOPHOSPHOR- RXNINORGPYROPHOSPHAT- RXN	STM4414 (is not found in KEGG)	nadh, Mthf, Succoa, nad, Phosphatidylethanolamine, Coa, AcCoA, Star, His, Asn, nadp, Peptidoglycan, UDP- Glucose, Phosphatidylglycerol, dATP, fad, Cys, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, clpn, Phosphatidylserin, dCTP,

			Met, lps, dGTP
29	ADENPRIBOSYLTRAN-RXN PRPPSYN-RXN	STM0483 (<i>apt</i>) STM1780 (<i>prsA</i>)	nadH, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP- Glucose, dATP, fad, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, dGTP
30	RIBULP3EPIM-RXN GLU6PDEHYDROG-RXN	STM1617 (epimerase), STM4080, (epimerase) STM3483 (<i>rpe1</i>) STM1886 (<i>zwf</i>)	nadH, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP- Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
31	GLUCOSAMINE-6-P-DEAMIN-RXN L-GLN-FRUCT-6-P-AMINOTRANS-RXN	STM0684 (<i>nagB</i>) STM4539 and STM 4540) (glucosamine-fructose-6-phosphate aminotransferase), STM3861 (<i>glmS</i>)	Peptidoglycan, lps
32	ARGSUCCINSYN-RXN arginine_tx	STM3290 (<i>argG</i>)	Arg
33	ORNCARBAMTRANSFER-RXN arginine_tx	STM4465 (ornithine carbamoyltransferase), STM4469 (<i>argL</i>)	Arg
34	N-ACETYLGLUTPREDUCT-RXN N-CARBAMOYLSARCOSINE-AMIDASE-RXN	STM4121 (<i>argC</i>)	Putrescine, Spermidine
35	F16ALDOLASE-RXN Glc_tx	STM3780 (<i>gatY</i>), STM4022 (<i>yihT</i>), STM4078 (<i>yneB</i>), STM3068 (<i>fba</i>), STM2141 (<i>fbaB</i>)	nadH, Mthf, Succoa, nad, Coa, AcCoA, Star, His, nadp, Peptidoglycan, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
36	RXN0-2381 TRYPSYN-RXN	STM1727 (<i>trpA</i>) STM1726 (<i>trpA</i>), STM1727 (<i>trpB</i>)	Trp

37	1TRANSKETO-RXN TRANSALDOL-RXN	STM2340 (transketolase), STM2341 (transketolase), STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>) STM4109 (<i>talC</i>), STM2473 (<i>talA</i>), STM0007 (<i>talB</i>)	Ips
38	SUCCOASYN-RXN 2OXOGLUTARATEDEH-RXN	STM0738 (<i>sucC</i>), STM0739 (<i>sucD</i>)	Succoa, Peptidoglycan, Lys
39	TRIOSEPI SOMERIZATION-RXN Glc_tx	STM4081 (<i>tpiA</i>)	nadh, Mthf, Succoa, nad, Phosphatidylethanolamine, Coa, AcCoA, Star, His, nadp, Peptidoglycan, UDP- Glucose, Phosphatidylglycerol, dATP, fad, Spermidine, nadph, gtp, Phe, amp, DGR, utp, Phosphatidate, Tyr, ctp, atp, Trp, clpn, Phosphatidylserin, dCTP, Ips, dGTP
40	O2_tx SUCCINATE-DEHYDROGENASE- UBIQUINONE-RXN	STM0732 (<i>sdhC</i>), STM0733 (<i>sdhD</i>), STM0734 (<i>sdhA</i>), STM0735 (<i>sdhB</i>)	UDP-Glucose, utp, dTTP, ctp, dCTP
41	ADENYL-KIN-RXN PRPPSYN-RXN	STM0488 (<i>adk</i>) STM1780 (<i>prsA</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, Asn, nadp, dATP, fad, Cys, Spermidine, nadph, atp, Met
42	ARGSUCCINLYA-RXN arginine_tx	STM4123 (<i>argH</i>)	Arg
43	ISPH2-RXN-(NADP) ISPH2-RXN-(NAD)	STM0049 (<i>ispH</i>) STM0049 (<i>ispH</i>)	Peptidoglycan
44	ADENRIBOSYLTRAN-RXN ADENYL-KIN-RXN	STM0483 (<i>apt</i>) STM0488 (<i>adk</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, Asn, nadp, UDP-Glucose, dATP, fad, Cys, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, Met, dGTP
45	CREATINASE-RXN ORNDECARBOX-RXN	STM0701 (<i>speF</i>), STM3114 (<i>speC</i>)	Putrescine, Spermidine

46	F16ALDOLASE-RXN TRIOSEPISOMERIZATION-RXN	STM3780 (<i>gatY</i>), STM4022 (<i>yihT</i>), STM4078 (<i>yneB</i>), STM3068 (<i>fba</i>), STM2141 (<i>fbaB</i>) STM4081 (<i>tpiA</i>)	nadh, nad, Phosphatidylethanolamine, nadp, Phosphatidylglycerol, nadph, DGR, Phosphatidate, clpn, Phosphatidylserin
47	PHOSPHOGLUCMUT-RXN BETA-PHOSPHOGLUCOMUTASE-RXN	STM2820 (<i>ygaB</i>), STM0698 (<i>pgm</i>)	Star, UDP-Glucose, Ips
48	PHOSGLYPHOS-RXN Glc_tx	STM3069 (<i>pgk</i>)	nadh, Mthf, Succoa, nad, Phosphatidylethanolamine, Coa, AcCoA, Star, His, nadp, Peptidoglycan, UDP-Glucose, Phosphatidylglycerol, dATP, fad, Spermidine, nadph, gtp, Phe, amp, DGR, utp, dTTP, Phosphatidate, Tyr, ctp, atp, Trp, clpn, Phosphatidylserin, dCTP, Ips, dGTP
49	INORGPYROPHOSPHAT-RXN INOSINEKIN-RXN	STM4414 (<i>ppa</i>) STM0491 (<i>gsk</i>)	nadh, Mthf, Succoa, nad, Phosphatidylethanolamine, Coa, AcCoA, Star, His, Asn, nadp, Peptidoglycan, UDP-Glucose, Phosphatidylglycerol, dATP, fad, Cys, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, clpn, Phosphatidylserin, dCTP, Met, Ips, dGTP
50	THREESYN-RXN THREODEHYD-RXN	STM0004 (<i>thrC</i>) STM3708 (<i>gatY</i>)	Ile, Thr
51	ACETYLORNTRANSAM-RXN 3.5.2.14-RXN	STM3468 (<i>argD</i>)	Putrescine, Spermidine
52	GAPOXNPAPHOSPHN-RXN Glc_tx	STM1290 (<i>yeal</i>)	nadh, Mthf, Succoa, nad, Phosphatidylethanolamine, Coa, AcCoA, Star, His, nadp, Peptidoglycan, UDP-Glucose, Phosphatidylglycerol, dATP, fad, Spermidine, nadph, gtp, Phe, amp, DGR, utp, dTTP,

			Phosphatidate, Tyr, ctp, atp, Trp, clpn, Phosphatidylserin, dCTP, lps, dGTP
53	PGLUCISOM-RXN Glc_tx	STM4221 (<i>pgi</i>)	Star, UDP-Glucose, lps
54	URACIL-PRIBOSYLTRANS-RXN DUTP-PYROP-RXN	STM2498 (<i>uup</i>) STM3731 (<i>dut</i>)	dTTP
55	NAD-SYNTH-NH3-RXN NAD-SYNTH-GLN-RXN	STM1310 (<i>nadE</i>) STM1310 (<i>nadE</i>)	nadhh, nad, nadp, nadph
56	PPENTOMUT-RXN PRPPSYN-RXN	STM4569 (<i>deoB</i>) STM1780 (<i>prsA</i>)	nadhh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, dGTP
57	N-ACETYLGLUTPREDUCT-RXN CREATININASE-RXN	STM4121 (<i>argC</i>)	Putrescine, Spermidine
57	6PGLUCONOLACT-RXN RIBULP3EPIM-RXN	STM0785 (<i>ybhE</i>) STM1617 (epimerase), STM4080 (epimerase), STM3483 (<i>rpe</i>)	nadhh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
59	HISTALDEHYD-RXN RXN-8001	STM2072 (<i>hisD</i>) STM2072 (<i>hisD</i>)	His
60	LCYSDESULF-RXN SERINE-O-ACETTRAN-RXN	STM3699 (<i>cysE</i>)	Succoa, Coa, AcCoA, Cys, Spermidine, Met
61	URA-PHOSPH-RXN DUTP-PYROP-RXN	STM4568 (<i>deoA</i>) STM3731 (<i>dut</i>)	dTTP
62	INORGPYROPHOSPHAT-RXN PRPPSYN-RXN	STM4414 (<i>ppa</i>) STM1780 (<i>prsA</i>)	nadhh, Mthf, Succoa, nad, Phosphatidylethanolamine, Coa, AcCoA, Star, His, Asn, nadp, Peptidoglycan, UDP-Glucose, Phosphatidylglycerol, fad, Cys, Spermidine, nadph, clpn, Phosphatidylserin, Met, lps

63	O-SUCCHOMOSERLYASE-RXNCYSPH-RXN	STM3624A (cystathionine gamma-synthase), STM4100 (<i>metB</i>) STM3624A (cystathionine gamma-synthase)	Spermidine, Met
64	INOPHOSPHOR-RXN ADENYL-KIN-RXN	STM0488 (<i>adk</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, Asn, nadp, UDP-Glucose, dATP, fad, Cys, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, Met, dGTP
65	RIB5PISOM-RXN PGLUCONDEHYDRAT-RXN	STM3063 (<i>rpiA</i>), STM1933 (hypothetical protein) STM1885 (<i>edd</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
66	INORGPYROPHOSPHAT-RXN PPENTOMUT-RXN	STM4414 (<i>ppa</i>) STM4569 (<i>deoB</i>)	nadh, Mthf, Succoa, nad, Phosphatidylethanolamine, Coa, AcCoA, Star, His, Asn, nadp, Peptidoglycan, UDP-Glucose, Phosphatidylglycerol, dATP, fad, Cys, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, clpn, Phosphatidylserin, dCTP, Met, lps, dGTP
67	N-ACETYLGLUTPREDUCT-RXN CREATININE-DEAMINASE-RXN	STM4121 (<i>argC</i>) STM3334 (cytocine deaminase)	Putrescine, Spermidine
68	INOSINEKIN-RXN PRPPSYN-RXN	STM0491 (<i>gsk</i>) STM1780 (<i>prsA</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, dGTP
69	CARBAMATE-KINASE-RXN RXN0-5224	STM4466 (carbamate kinase), STM0532 (<i>argC</i>) PSLT046 (putative carbonic anhydrase), STM0171 (<i>yadF</i>)	UDP-Glucose, utp, dTTP, ctp, dCTP
70	2TRANSKETO-RXN TRANSALDOL-RXN	STM2340 (transketolase), STM2341 (transketolase), STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>) STM4109 (<i>talC</i>), STM2473 (<i>talA</i>), STM0007 (<i>talB</i>)	Mthf, Phe, Tyr, Trp

71	ORNDECARBOX-RXN CREATININE-DEAMINASE-RXN	STM0701 (<i>speF</i>), STM3114 (<i>speC</i>) STM3334 (cytosine deaminase)	Putrescine, Spermidine
72	ASNSYNB-RXN ASNSYNA-RXN	STM0680 (<i>asnB</i>) STM3877 (<i>asnA</i>)	Asn
73	3.5.2.14-RXN ORNDECARBOX-RXN	STM0701 (<i>speF</i>), STM3114 (<i>speC</i>)	Putrescine, Spermidine
74	O-SUCCHOMOSERLYASE-RXN HOMOSERKIN-RXN	STM3624A (cystathionine gamma-synthase) STM4100 (<i>metB</i>) STM0003 (<i>thrB</i>)	Spermidine, Met
75	RIBULP3EPIM-RXN TRANSALDOL-RXN	STM1617 (epimerase), STM4080, (epimerase) STM3483 (<i>rpeI</i>) STM4109 (<i>talC</i>), STM2473 (<i>talA</i>), STM0007 (<i>talB</i>)	Mthf, Phe, Tyr, Trp
76	N-CARBAMOYLSARCOSINE-AMIDASE-RXN ORNDECARBOX-RXN	STM0701 (<i>speF</i>), STM3114 (<i>speC</i>)	Putrescine, Spermidine
77	GLYOHMETRANS-RXN PSERTRANSAM-RXN	STM2555 (<i>glyA</i>) STM0977 (<i>serC</i>)	Phosphatidylethanolamine, Ser, Trp, Phosphatidylserin
78	6PGLUCONOLACT-RXN 2TRANSKETO-RXN	STM0785 (<i>ybhE</i>) STM2340 (transketolase), STM2341 (transketolase), STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, lps, dGTP
79	PPENTOMUT-RXN ADENYL-KIN-RXN	STM4569 (<i>deoB</i>) STM0488 (<i>adk</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, Asn, nadp, UDP-Glucose, dATP, fad, Cys, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, Met, dGTP
80	ACETYLGLUTKIN-RXN CREATININASE-RXN	STM4122 (<i>argB</i>)	Putrescine, Spermidine
81	6PFRUCTPHOS-RXN TRIOSEPI SOMERIZATION-RXN	STM1326 (<i>pfkB</i>), STM4062 (<i>pfkA</i>) STM4081 (<i>tpiA</i>)	nadh, nad, Phosphatidylethanolamine, nadp, Phosphatidylglycerol, nadph, DGR, Phosphatidate, clpn, Phosphatidylserin

82	HISTOLDEHYD-RXN RXN-8001	STM2072 (<i>hisD</i>) STM2072 (<i>hisD</i>)	His
83	DIHYDROPICRED-RXN-(NAD) DIHYDROPICRED-RXN-(NADP)	STM0064 (<i>dapB</i>) STM0064 (<i>dapB</i>)	Peptidoglycan, Lys
84	N-ACETYLGLUTPREDUCT-RXN CREATINASE-RXN	STM4121 (<i>argC</i>)	Putrescine, Spermidine
85	RXN0-2382 TRYPSYN-RXN	STM1726 (<i>trpA</i>), STM1727 (<i>trpB</i>) STM1726 (<i>trpA</i>), STM1727 (<i>trpB</i>)	Trp
86	N-ACETYLGLUTPREDUCT-RXN arginine_tx	STM4121 (<i>argC</i>)	Putrescine, Arg, Spermidine
87	ACETYLORNTRANSAM-RXN CREATININASE-RXN	STM3468 (<i>argD</i>)	Putrescine, Spermidine
88	CARBPSYN-RXN CARBAMATE-KINASE-RXN	STM0066 (<i>carA</i>), STM0067 (<i>carB</i>) STM4466 (carbamate kinase), STM0532 (<i>argC</i>)	UDP-Glucose, utp, dTTP, ctp, dCTP
89	ACETYLGLUTKIN-RXN arginine_tx	STM4122 (<i>argB</i>)	Putrescine, Arg, Spermidine
90	3.5.2.14-RXN N-ACETYLGLUTPREDUCT-RXN	STM4121 (<i>argC</i>)	Putrescine, Spermidine
91	ACETYLORNTRANSAM-RXN N-CARBAMOYLSARCOSINE-AMIDASE-RXN	STM3468 (<i>argD</i>)	Putrescine, Spermidine
92	HOMOSERKIN-RXN THREODEHYD-RXN	STM0003 (<i>thrB</i>) STM3708 (<i>thd</i>)	Ile, Thr
93	1TRANSKETO-RXN RIB5PISOM-RXN	STM2340 (transketolase), STM2341 (transketolase), STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>) STM3063 (<i>rpiA</i>), STM1933 (hypothetical protein)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP-Glucose, dATP, fad, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, dCTP, dGTP

94	RIBULP3EPIM-RXN 2TRANSKETO-RXN	STM1617 (epimerase), STM4080 (epimerase), STM3483 (<i>rpe</i>) STM2340 (transketolase), STM2341 (transketolase), STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>)	Mthf, Phe, Tyr, Trp, Ipsi
95	2TRANSKETO-RXN GLU6PDEHYDROG-RXN	STM2340 (transketolase), STM2341 (transketolase), STM2474 (<i>tktB</i>), STM3076 (<i>tktA</i>) STM1886 (<i>zwf</i>)	nadh, Mthf, Succoa, nad, Coa, AcCoA, His, nadp, UDP- Glucose, dATP, fad, Spermidine, nadph, gtp, Phe, amp, utp, Tyr, ctp, atp, Trp, dCTP, Ipsi, dGTP
96	O2_tx Glc_tx		nadh, Mthf, Ile, Succoa, nad, Phosphatidylethanolamine, Coa, AcCoA, Star, His, Asn, nadp, Peptidoglycan, Val, UDP-Glucose, Phosphatidylglycerol, dATP, fad, Cys, Thr, Spermidine, nadph, gtp, Phe, amp, DGR, utp, dTTP, Phosphatidate, Lys, Tyr, ctp, atp, Ser, Trp, clpn, Phosphatidylserin, dCTP, Met, Leu, Ipsi, dGTP
97	ACETYLORNTRANSAM-RXN arginine_tx	STM3468 (<i>argD</i>)	Putrescine, Arg, Spermidine
98	ACETYLORNTRANSAM-RXN CREATININE-DEAMINASE-RXN	STM3468 (<i>argD</i>) STM3334 (cytosine deaminase)	Putrescine, Spermidine
99	ACETYLGLUTKIN-RXN N-CARBAMOYLSARCOSINE- AMIDASE-RXN	STM4122 (<i>argB</i>)	Putrescine, Spermidine
100	SPONTPRO-RXN proline_tx		Pro
101	INORGPYROPHOSPHAT-RXN ADENPRIBOSYLTRAN-RXN	STM4414 (<i>ppa</i>) STM0483 (<i>apt</i>)	nadh, Mthf, Succoa, nad, Phosphatidylethanolamine, Coa, AcCoA, Star, His, Asn, nadp, Peptidoglycan, UDP- Glucose, Phosphatidylglycerol, dATP, fad, Cys, Spermidine, nadph, gtp, amp, utp, ctp, atp, Trp, clpn,

			Phosphatidylserin, dCTP, Met, lps, dGTP
102	1.5.1.20-RXN-(NAD) 1.5.1.20-RXN-(NADP)	STM4105 (<i>metF</i>) STM4105 (<i>metF</i>)	Mthf, Spermidine, Met

Analysis was conducted using simulated medium composed of glucose, sulphate, phosphate, glycine, alanine, proline, glutamine, arginine, aspartate, glutamate.

Abbreviations (obvious metabolites such as NAD-species are omitted): Mthf - 5-methyl-tetrahydrofolate, His - Histidine, Trp - Tryptophan, Phe - Phenylalanine, lps - Lipopolysaccharide, Tyr - Tyrosine, DGR - 1,2-diacylglycerol, Met - Methionine, clpn - Cardiolipin, Arg - Arginine, Lys - Lysine, Ile - Isoleucine, Thr - Threonine, Asn - Asparagine, Succoa - Succinate CoA, AcCoA - Acetyl-CoA, Star - starch, Val - Valine, Cys - Cysteine, Ser - Serine, Leu - Leucine