

Submitted to BCO-DMO [2016-04-14]

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Isolation of bacterial and phage strains. A lytic phage (Φ 2047B) was isolated from viral concentrates of Raunefjorden seawater using standard bacteriophage enrichment. Briefly, viral (ca. 10X) concentrates of this seawater were produced using a LabScale (tangential flow filtration) TFF System (Millipore, Billerica, MA) equipped with a Pellicon XL 50 Ultrafiltration Cassette (Millipore). Phage specific for *Sulfitobacter* sp. 2047 were enriched by adding early exponential phase host cells grown in ASW to an OD₅₄₀ of 0.15-0.17 with the viral concentrate at a ratio of 2:1:2 of cell culture: ASW: Raunefjorden viral concentrate. Following incubation at 20°C for 48h, enrichments were centrifuged at 5000 x g for 10 min and then filtered through a 0.22 μ m cellulosic filter (BD, Franklin Lakes, NJ, USA). Clarified phage enrichments were then subject to plaque assay using the same host. Plaque purification and preparation of phage stocks were based on standard methods (Kropinski et al 2009). Isolated phage were plaque-purified six times. Once purified, concentrated lysates were made by gently washing soft agar from 10 completely lysed plates of each phage strain using 7 mL of MSB buffer [230 mM NaCl, 5.3 mM KCl, 3.9 mM CaCl₂, 0.1 mM H₃BO₃, 11.8 mM MgSO₄, 11.2 mM MgCl₂, 0.8 mM NaHCO₃, 5 mM NH₄Cl, 75 μ M K₂HPO₄, and 10 mM Tris-HCl (pH 7.5)]. The final purified phage concentrate was 0.22 μ m filtered and stored at 4°C in the dark.

Microscopy. For microscopic direct counts, *Sulfitobacter* sp. 2047 cells were stained with SYBR Gold stain (25 X concentration, Invitrogen, Carlsbad, CA, USA) and enumeration was performed on a Leica DMRXA microscope using filter cube L5 (excitation filter BP 480/40, suppression filter BP 527/30) according to protocols previously described (Patel et al 2007). For each slide, 10 fields were counted.

Quantitative PCR. The genome sequence for Φ 2047B was completed under the auspices of the Gordon and Betty Moore Foundation Marine Phage, Viruses and Viromes Project (<http://www.broadinstitute.org/annotation/viral/Phage>). The genome sequence of the host was completed at the Center for Pediatric Genome Medicine Children's Mercy Hospitals and Clinics in Kansas City, MO. Roughly 26.6 million reads, averaging 100 bps in length each, were obtained on a Illumina HiSeq2000. Assembly was achieved using CLC Workbench (CLCbio, Cambridge, MA). Annealing temperatures were initially determined empirically by gradient endpoint PCR analysis (50 to 70°C) of each primer set with viral lysates or host DNA. Optimal annealing temperatures were further refined following primer concentration optimization in qPCR assay conditions. To identify the most appropriate primer concentrations, a matrix of various concentrations (100, 500, 1000, and 1500 nM) of forward and reverse primers was tested with 10⁵ copies of the corresponding standard. The primer concentration combinations yielding low threshold cycle number (*C_t*) values and high efficiencies were selected as most appropriate for use in assays. Samples were defrosted and lysed in a DNA Engine Thermo cycler (PTC-200) for 15 minutes at 95°C and then diluted 10 and 100-fold in 10mM Tris-HCl pH 8.0. The primers used in this study targeted the phage tail fibers and the phage polymerase gene of the prophage and Φ 2047B, respectively. Tail fiber genes were amplified using forward (5'-TCGTGGTGCAGATCCAGTTA-3') and reverse (5'-TATGAGGCGGAATTTGAAGC-3') primers. Phage polymerase genes were amplified using forward (5'-AGATACTGGGAAGGGTGCT-3') and reverse (5'-TCAGGTGAGGAGCCAAGTCT-3') primers.

Chromatographic details for metabolite analysis. Compounds were separated by high performance liquid chromatography (HPLC). A quaternary pump was used to generate a gradient for elution of compounds from the stationary phase. Samples were delivered to the column after injection (10 μ L) with an autosampler kept at 4 °C. The separation eluent was directly passed to the mass spectrometer.

For positive ion mode analyses, the stationary phase was aminopropyl functionalized particles (5 μ m pore size, 100 Å particle size) packed into a 250 x 2 mm column (Luna NH₂ Phenomenex, Torrance, CA). The flow rate was 150 μ l/min and the column was maintained at 10 °C. The mobile phases were 95% 20 mM ammonium acetate, 20 mM ammonium hydroxide (in HPLC grade water, buffered at pH 9.4) and 5% HPLC grade acetonitrile (solvent A) and HPLC grade acetonitrile (solvent B). The solvents were used to construct a 40 min gradient elution profile as follows: t = 0 min: 15% solvent A, 85% solvent B; t = 15 min, 100% solvent A, 0% solvent B; t = 28 min, 100% solvent A, 0% solvent B; t = 30 min, 15% solvent A, 85% solvent B; t = 40 min, 15% solvent A, 85% solvent B.

For negative ion mode analyses, the stationary phase was a Synergi Hydro-RP C18 (4 μ m pore size, 80 Å particle size) packed into a 150 x 2 mm column (Phenomenex). The flow rate was 200 μ L/min and the column was maintained at 25 °C. The mobile phases were 11 mM tributylamine and 15 mM acetic acid in 97% HPLC grade water with 3% HPLC grade methanol (solvent A) and HPLC grade methanol (solvent B). The solvents were used to construct a 50 min gradient elution profile as follows: t = 0 min: 100% solvent A, 0% solvent B; t = 5 min, 100% solvent A, 0% solvent B; t = 10 min, 80% solvent A, 20% solvent B; t = 15min, 80% solvent A, 20% solvent B; t = 30min, 35% solvent A, 65% solvent B; t = 33 min, 5% solvent A, 95% solvent B, t = 37 min, 5% solvent A, 95% solvent B; t = 38 min, 100% solvent A, 0% solvent B; t = 50 min, 100% solvent A, 0% solvent B.

Mass spectrometric detection parameters. Following HPLC separation, samples were delivered to the electrospray ionization (ESI) chamber of a triple quadrupole mass spectrometer via a 0.1 mm (internal diameter) fused silica capillary. The ESI source spray voltage was set to 4500 V for detection in positive ion mode and 3000 V for detection in negative ion mode. The sheath gas was nitrogen at 40 psi. Argon was used as the collision gas at 1.5 Torr and the inlet capillary temperature was maintained at 290 °C. Selected reaction monitoring (SRM) technology was used for sample analysis. The scan time and width for each SRM was 0.05 s and 1 *m/z*, respectively. The complete SRM detection parameters for the majority of compounds has been previously reported by Rabinowitz and colleagues (Bajad et al 2006, Bennett et al 2008, Rabinowitz and Kimball 2007). The SRM detection parameters for the flux analysis are shown in Table S2.

References

Bajad SU, Lu W, Kimball EH, Yuan J, Peterson C, Rabinowitz JD (2006). Separation and quantitation of water soluble cellular metabolites by hydrophilic interaction chromatography-tandem mass spectrometry. *Journal of Chromatography A* **1125**: 76-88.

Bennett BD, Yuan J, Kimball EH, Rabinowitz JD (2008). Absolute quantitation of intracellular metabolite concentrations by an isotope ratio-based approach. *Nat Protocols* **3**: 1299-1311.

Kropinski AM, Mazzocco A, Waddell TE, Lingohr E, Johnson RP (2009). Enumeration of bacteriophages by double agar overlay plaque assay. *Bacteriophages*. Springer. pp 69-76.

Patel A, Noble RT, Steele JA, Schwalbach MS, Hewson I, Fuhrman JA (2007). Virus and prokaryote enumeration from planktonic aquatic environments by epifluorescence microscopy with SYBR Green I. *Nat Protocols* **2**: 269-276.

Rabinowitz JD, Kimball E (2007). Acidic acetonitrile for cellular metabolome extraction from *Escherichia coli*. *Analytical Chemistry* **79**: 6167-6173.

SI Tables

Table S1. Virus Gene Copies

Time post infection (min)	Virus Gene Copies (Φ2047A) Average	Range	Virus Gene Copies (Φ2047B) Average	Range
15	1.55E+09	± 2.72E+08	4.37E+07	± 4.06E+06
30	1.48E+09	± 6.02E+08	4.08E+07	± 7.53E+06
60	1.11E+09	± 3.33E+08	3.88E+07	± 4.41E+06
120	1.27E+10	± 1.95E+09	5.25E+07	± 1.03E+07
240	1.05E+11	± 9.73E+09	6.20E+08	± 9.36E+07
360	2.18E+11	± 2.91E+10	1.82E+09	± 1.85E+08
480	3.51E+11	± 1.03E+10	3.50E+09	± 5.26E+08

Table S2. Flux method metabolites with ¹³C labeling pattern looked for in SRM method

Metabolite	Molecular Formula	# of ¹³ C in Parent <i>m/z</i>	# of ¹³ C in Fragment <i>m/z</i>
2-Oxoglutarate	C ₅ H ₅ O ₅ ⁻	0, 5	0, 4
5-Methylthioadenosine	C ₁₁ H ₁₆ N ₅ O ₃ S ⁺	0, 1, 10, 11	0, 0, 5, 5
Acetyl CoA	C ₂₃ H ₃₉ N ₇ O ₁₇ P ₃ S ⁺	0, 2, 23	0, 2, 13
Alanine	C ₃ H ₈ NO ₂ ⁺	0, 2, 2, 3	0, 1, 2, 2
Aspartate	C ₄ H ₈ NO ₄ ⁺	0, 2, 2, 2, 4	0, 0, 1, 2, 2
Citrate & Isocitrate	C ₆ H ₇ O ₇ ⁻	0, 2, 2, 6	0, 1, 2, 5
D-glucono-δ-lactone-6-phosphate	C ₆ H ₁₀ O ₉ P ⁻	0, 6	0, 0
Fumarate, Maleate, & Isoketovalerate	C ₄ H ₃ O ₄ ⁻	0, 4	0, 3
Glutamate	C ₅ H ₁₀ NO ₄ ⁺	0, 2, 2, 4, 4, 5	0, 1, 2, 3, 4, 4
Glutamine	C ₅ H ₁₁ N ₂ O ₃ ⁺	0, 2, 2, 4, 4, 5	0, 1, 2, 3, 4, 4
Phosphoenolpyruvate	C ₃ H ₄ O ₆ P ⁻	0, 3	0, 0
Proline	C ₅ H ₁₀ NO ₂ ⁺	0, 5	0, 4
Serine	C ₃ H ₈ NO ₃ ⁺	0, 2, 2, 3	0, 1, 2, 2
Succinate & Methylmalonate	C ₄ H ₅ O ₄ ⁻	0, 2, 2, 4	0, 0, 2, 3
Threonine	C ₄ H ₁₀ NO ₃ ⁺	0, 4	0, 3

Metabolites are measured in Parent-Fragment *m/z* pairs, i.e. (0-0 & 5-4 for 2-oxoglutarate). Other carbons are unlabeled ¹²C.

Table S3. Time series fold change of metabolites used in Figure 2

Metabolites	15 min	30 min	60 min	120 min	240 min	360 min	480 min
1,3 & 2,3 Diphosphoglycerate	1.44	1.45	1.19	1.51	2.29	2.41	3.42
1-Methylhistidine	2.84	1.86	1.52	1.91	2.81	2.59	3.48
3-Phosphoglycerate	1.35	0.83	1.21	1.70	1.58	1.50	1.70
4-Hydroxybenzoate	1.20	1.34	1.42	1.81	2.65	1.95	3.42
5-Methyltetrahydrofolate	1.58	0.75	1.21	1.38	3.90	3.74	5.94
5'-Methylthioadenosine	2.01	2.53	1.03	1.98	2.64	2.43	2.61
Acetyl CoA	1.50	1.41	1.47	1.52	1.63	1.56	1.42
Acetyl Phosphate	1.03	4.74	0.61	2.93	2.52	2.76	0.17
ADP	2.11	0.98	1.49	1.32	1.42	1.52	1.74
Alanine	2.29	1.70	1.57	1.60	1.61	2.89	3.73
AMP	1.50	1.33	1.40	1.04	1.53	1.98	1.92
Asparagine	N/A	1.57	2.09	1.24	1.86	2.30	3.24
Aspartate	1.53	1.57	1.26	1.29	1.53	1.42	1.71
ATP	N/A	N/A	N/A	1.50	1.77	1.14	1.59
Betaine	2.96	1.43	1.28	1.48	1.93	2.50	3.00
Ceramide	1.37	1.27	1.21	1.28	1.38	2.30	1.96
Choline	1.58	1.50	1.32	1.44	2.04	2.66	3.42
Citrate	1.78	1.68	1.69	2.22	2.80	1.51	2.41
CoA	1.09	1.33	0.63	1.44	2.13	1.63	2.65
Cysteine	1.83	1.64	1.33	1.35	2.06	2.79	2.50
dCDP	1.47	1.39	1.38	1.43	2.31	2.28	3.54
dGTP	2.54	0.64	1.14	1.87	1.74	1.14	1.49
DL-Pipecolic Acid	N/A	1.44	1.29	1.17	1.76	2.60	3.32
dUTP	0.00	0.00	3.42	1.95	2.35	1.66	3.40
					1000.0	1000.0	
Erythrose-4-Phosphate	0.00	1.08	2.71	1.46	0	0	1.33
Ethanolamine	1.80	1.12	1.04	1.25	2.24	2.77	4.22
FAD	1.30	1.48	1.31	1.29	1.63	1.19	1.89
Farnesylpyrophosphate	N/A	1.41	0.77	2.46	4.98	6.03	4.42
Fructose-1,6-Bisphosphate	1.16	1.96	1.19	1.94	2.96	2.34	3.56
Fumarate, Maleate, & Isoketovalerate	1.18	1.10	1.05	1.65	1.59	3.03	3.73
Glucono-1,5-Lactone-6-Phosphate	1.26	1.47	1.40	2.00	11.24	2.87	3.55
Glutamate	1.42	1.37	1.40	1.52	1.67	1.60	1.58
Glutamine	0.87	1.79	1.87	2.30	3.52	5.67	7.47
						1000.0	
Glycerophosphocholine	N/A	N/A	N/A	N/A	N/A	0	1.16
GMP	1.53	0.89	1.28	1.96	2.73	1.85	2.41
GTP	4.15	0.30	0.99	2.00	0.88	0.62	0.72
Hexose Phosphate	3.78	1.12	2.40	1.37	1.33	2.06	2.95
Histidinol	N/A	0.00	N/A	1.44	0.88	1.07	0.67
				1000.0			
Homoserine	1.66	1.80	1.88	0	1.57	3.30	2.67
Lysine	1.43	1.26	1.53	1.49	1.56	1.77	2.40
Malate	1.19	1.21	1.21	1.55	1.51	1.51	1.78

Malonyl CoA	1.70	1.59	2.28	1.21	1.52	1.54	1.67
Methylmalonic Acid	1.26	1.20	1.26	1.93	1.61	1.86	3.24
N-Acetylglucosamine-1-Phosphate	N/A	0.00	0.00	N/A	N/A	N/A	N/A
N-Acetylglutamate	0.87	1.05	1.44	1.81	1.34	2.09	2.01
N-Acetylglutamine	1.43	1.35	1.35	1.43	1.55	1.69	1.60
N-Acetyllysine	1.43	1.33	1.42	1.39	1.65	1.66	1.64
NAD	1.23	1.12	1.13	1.65	1.60	1.88	3.00
NADH	1.23	1.51	0.84	2.58	1.56	1.58	6.89
NADP	1.45	0.75	1.76	1.25	1.47	0.92	1.77
NADPH	1.07	1.65	1.07	1.45	1.79	1.76	2.73
Nicotinate	1.28	1.43	1.26	1.76	1.87	2.48	3.48
O-Acetylserine	1.41	1.81	0.69	2.08	2.41	1.54	5.40
Orotate	1.43	1.34	1.24	1.29	4.64	2.62	3.34
Orotidine Phosphate	0.00	0.87	1.03	1.29	3.36	1.55	4.49
Oxidized Glutathione (GSSG)	1.59	1.31	1.69	0.90	2.42	2.42	1.96
Palmitate	0.87	0.79	0.92	4.76	1.45	2.46	2.81
		1000.0	1000.0			1000.0	1000.0
Pentose Phosphate	N/A	0	0	N/A	N/A	0	0
Phenylpropionic Acid	1.48	1.46	1.24	1.24	1.79	2.54	3.78
Phosphatidylcholine & Phosphatidylethanolamine	1.31	1.04	1.09	2.08	1.47	1.45	1.57
Phosphoenolpyruvate	1.50	0.93	1.17	1.87	1.64	1.27	1.55
Proline	1.52	1.59	1.53	1.55	1.85	2.40	2.89
Propionyl CoA	1.25	0.93	0.84	1.51	1.45	2.03	3.16
Pyridoxine	1.90	1.69	1.44	1.55	2.15	2.93	3.56
Reduced Glutathione (GSH)	1.18	0.87	1.53	1.80	2.15	2.23	2.09
Ribulose-1,5-Bisphosphate	N/A	N/A	N/A	N/A	0.00	1.18	0.00
S-Adenosylmethionine	1.53	2.33	1.55	1.14	2.01	3.28	3.92
Sarcosine	N/A	N/A	N/A	1.71	1.87	2.96	3.11
Sedoheptulose-7-Phosphate	0.96	0.96	1.66	3.50	2.90	1.75	3.76
Serine	0.74	1.45	1.59	1.65	1.82	2.00	2.41
Succinate	1.25	1.21	1.28	1.87	1.64	1.86	3.26
Succinyl CoA	0.87	2.35	7.95	1.71	1.58	1.53	2.64
TDP	0.95	0.71	1.86	4.24	4.07	2.44	3.51
Thiamine	1.68	1.23	1.36	1.86	1.79	3.55	3.51
Threonine	N/A	1.34	1.51	1.58	2.05	2.70	3.20
Tryptophan	1.68	1.11	4.27	1.52	1.67	2.24	1.34
UDP	1.36	1.24	1.90	3.06	2.24	2.52	3.92
UDP-D-Glucose	2.68	2.34	1.95	1.66	1.46	1.64	2.00
UDP-D-Glucuronate & Galacturonate	2.90	5.77	8.63	12.73	9.19	10.15	7.18
UDP-N-Acetylglucosamine	1.60	0.50	0.55	0.47	0.45	0.54	0.90
Urea	1.81	1.13	1.04	1.26	2.25	2.82	4.23
UTP	5.38	0.74	1.35	2.12	1.91	1.14	1.40
Valine	2.01	1.33	3.08	1.23	2.59	2.69	2.53

Table S4. Time series *p* value of metabolites used in Figure 2

Metabolite	15 min	30 min	60 min	120 min	240 min	360 min	480 min
1,3 & 2,3 Diphosphoglycerate	0.01	0.02	0.15	0.11	0.13	0.00	0.00
1-Methylhistidine	N/A	0.29	0.33	0.00	0.02	0.06	0.03
3-Phosphoglycerate	0.12	0.42	0.34	0.13	0.04	0.05	0.01
4-Hydroxybenzoate	0.28	0.02	0.04	0.05	0.24	0.09	0.00
5-Methyltetrahydrofolate	0.37	0.35	0.71	0.31	0.13	0.11	0.07
5'-Methylthioadenosine	0.35	0.00	0.93	0.13	0.03	0.00	0.02
Acetyl CoA	0.25	0.01	0.27	0.03	0.00	0.01	0.03
Acetyl Phosphate	0.96	0.13	0.12	0.31	0.04	0.43	N/A
ADP	0.28	0.94	0.25	0.02	0.10	0.02	0.01
Alanine	0.02	0.00	0.01	0.01	0.05	0.02	0.00
AMP	0.12	0.11	0.03	0.76	0.08	0.03	0.00
Asparagine	N/A	N/A	0.15	0.06	0.00	0.00	N/A
Aspartate	0.02	0.01	0.27	0.11	0.00	0.06	0.00
ATP	N/A	N/A	N/A	0.02	0.17	0.58	0.15
Betaine	0.25	0.00	0.02	0.00	0.00	0.00	0.00
Ceramide	0.21	0.01	0.04	0.06	0.17	0.02	0.02
Choline	0.17	0.01	0.01	0.01	0.00	0.00	0.00
Citrate	0.11	0.02	0.20	0.37	0.03	0.27	0.03
CoA	0.75	0.41	0.19	0.09	0.00	0.07	0.01
Cysteine	0.16	0.12	0.22	0.05	0.00	0.00	0.01
dCDP	0.11	0.06	0.02	0.43	0.06	0.05	0.00
dGTP	0.22	0.39	0.66	0.17	0.01	0.54	0.13
DL-Pipecolic Acid	N/A	0.32	0.34	0.46	0.06	0.01	0.00
dUTP	N/A	N/A	N/A	0.14	0.11	0.32	0.03
Erythrose-4-Phosphate	N/A	N/A	N/A	0.57	N/A	N/A	N/A
Ethanolamine	0.15	0.67	0.89	0.16	0.02	0.01	0.01
FAD	0.21	0.11	0.31	0.11	0.01	0.43	0.00
Farnesylpyrophosphate	N/A	N/A	N/A	0.30	0.29	0.10	0.16
Fructose-1,6-Bisphosphate	0.67	0.07	0.64	0.18	0.02	0.16	0.01
Fumarate, Maleate, & Isoketovaleate	0.05	0.68	0.83	0.03	0.02	0.14	0.05
Glucono-1,5-Lactone-6-Phosphate	0.09	0.01	0.05	0.12	0.36	0.00	0.00
Glutamate	0.06	0.01	0.08	0.01	0.00	0.01	0.00
Glutamine	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Glycerophosphocholine	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GMP	0.25	0.74	0.45	0.01	0.03	0.02	0.00
GTP	0.35	0.29	0.99	0.26	0.73	0.42	0.56
Hexose Phosphate	0.08	0.84	0.08	0.55	0.58	0.15	0.08
Histidinol	N/A	N/A	N/A	0.05	0.68	0.89	0.03
Homoserine	0.33	0.02	0.08	N/A	N/A	0.14	N/A
Lysine	0.17	0.17	0.14	0.01	0.00	0.01	0.00
Malate	0.12	0.04	0.01	0.14	0.01	0.03	0.01
Malonyl CoA	0.09	0.02	0.08	0.51	0.01	0.22	0.05
Methylmalonic Acid	0.03	0.00	0.04	0.15	0.00	0.00	0.01
N-Acetylglucosamine-1-Phosphate	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N-Acetylglutamate	N/A	0.42	0.09	0.21	0.01	0.00	0.00
N-Acetylglutamine	0.06	0.01	0.09	0.03	0.02	0.01	0.02

N-Acetyllysine	0.05	0.04	0.10	0.02	0.00	0.00	0.00
NAD	0.35	0.44	0.46	0.03	0.16	0.22	0.00
NADH	0.56	0.26	0.58	0.07	0.06	0.26	0.04
NADP	0.46	0.42	0.18	0.51	0.26	0.76	0.06
NADPH	0.56	0.12	0.90	0.03	0.01	0.08	0.00
Nicotinate	0.02	0.00	0.02	0.06	0.00	0.01	0.00
O-Acetylserine	0.66	0.13	0.49	N/A	0.25	0.46	0.02
Orotate	0.01	0.08	0.12	0.02	0.28	0.06	0.00
Orotidine Phosphate	N/A	0.75	0.93	0.52	0.26	0.07	N/A
Oxidized Glutathione (GSSG)	0.46	0.49	0.25	0.84	0.01	0.00	0.12
Palmitate	0.78	0.55	0.84	0.33	0.41	0.06	0.03
Pentose Phosphate	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Phenylpropionic Acid	0.00	0.02	0.12	0.64	0.02	0.01	0.00
Phosphatidylcholine & Phosphatidylethanolamine	0.31	0.87	0.47	0.29	0.00	0.00	0.00
Phosphoenolpyruvate	0.10	0.70	0.50	0.17	0.02	0.12	0.00
Proline	0.13	0.02	0.06	0.01	0.00	0.00	0.00
Propionyl CoA	0.56	0.77	0.59	0.02	0.07	0.00	0.00
Pyridoxine	0.10	0.04	0.09	0.01	0.01	0.00	0.00
Reduced Glutathione (GSH)	0.80	0.70	0.42	0.00	0.01	0.07	0.12
Ribulose-1,5-Bisphosphate	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S-Adenosylmethionine	0.38	0.05	0.06	0.77	0.03	0.02	0.00
Sarcosine	N/A	N/A	N/A	0.02	0.00	0.02	0.00
Sedoheptulose-7-Phosphate	0.93	0.91	0.04	0.39	0.10	0.37	0.14
Serine	N/A	0.32	N/A	0.11	0.09	0.02	0.00
Succinate	0.05	0.00	0.02	0.13	0.00	0.00	0.01
Succinyl CoA	0.84	0.18	0.13	0.02	0.01	0.02	0.03
TDP	0.87	0.37	0.24	0.33	0.35	0.00	0.02
Thiamine	0.07	0.02	0.03	0.00	0.13	0.01	0.05
Threonine	N/A	N/A	0.21	0.04	0.01	0.00	0.00
Tryptophan	0.50	0.75	0.29	0.21	0.19	0.07	0.24
UDP	0.25	0.46	0.06	0.17	0.10	0.01	0.00
UDP-D-Glucose	0.00	0.00	0.00	0.22	0.02	0.00	0.00
UDP-D-Glucuronate & Galacturonate	0.01	0.01	0.00	0.04	0.00	0.00	0.00
UDP-N-Acetylglucosamine	0.10	0.01	0.01	0.05	0.00	0.02	0.42
Urea	0.14	0.67	0.89	0.14	0.02	0.01	0.01
UTP	0.15	0.59	0.61	0.30	0.04	0.67	0.19
Valine	0.15	0.02	0.12	0.31	0.01	0.00	0.00

Table S5. Flux area counts uninfected replicate 1 used in Figure 5 & Table 1

Component	0 min	5 min	15 min	30 min	60 min	120 min
5-methylthioadenosine	177323.8	148425.2	135351.6	71486.4	25839.1	13628.5
5-methylthioadenosine_1-0	11066.0	21329.5	67619.1	71177.0	35161.2	22817.6
5-methylthioadenosine_10-5	0.0	0.0	0.0	0.0	0.0	563.5
5-methylthioadenosine_11-5	0.0	0.0	0.0	0.0	0.0	706.3
Sum	188389.8	169754.6	202970.6	142663.4	61000.3	37716.0
Acetyl-CoA	10978.0	14623.6	21652.9	33083.1	27215.1	15550.4
Acetyl-CoA_2-2	46379.2	67000.5	80854.3	123844.6	72046.3	45573.4
Sum	57357.2	81624.1	102507.2	156927.7	99261.4	61123.8
alanine	41073.1	22808.9	0.0	0.0	0.0	0.0
Alanine_2-1	7180.5	9690.9	0.0	5322.4	0.0	11166.2
Alanine_2-2	6471.3	6662.1	0.0	0.0	9766.0	4875.3
Alanine_3-2	7515.5	4923.4	0.0	10099.2	17341.7	14585.8
Sum	62240.3	44085.3	0.0	15421.6	27107.6	30627.4
Aspartate	55719.7	21896.1	0.0	0.0	0.0	0.0
Aspartate_2-2	0.0	13381.0	1052.9	9415.8	5309.3	850.4
Aspartate_4-2	1585.4	4490.6	12695.5	14766.0	29079.5	34441.8
Sum	57305.0	39767.7	13748.3	24181.8	34388.7	35292.2
citrate & isocitrate	87702.4	37460.7	14722.0	0.0	0.0	0.0
Citrate & IsoCitrate_2-1	123270.9	62419.6	23982.0	4584.0	3380.3	10401.2
Citrate & IsoCitrate_2-2	118844.2	65288.2	33443.8	19588.8	8015.4	20931.5
Citrate & IsoCitrate_6-5	7473.0	23047.2	82620.8	82863.1	49316.2	155958.0
Sum	337290.4	188215.8	154768.6	107035.9	60711.9	187290.7
D-glucono-d-lactone-6-phosphate	41020.0	29189.9	19451.4	39756.9	37763.1	29013.6
D-Glucono-d-lactone-6-phosphate_6-0	5286.4	3001.3	2034.2	656.3	1838.9	0.0
Sum	46306.3	32191.3	21485.6	40413.2	39602.0	29013.6
Fumarate, maleate, & isoketovalerate	158882.5	59119.9	65477.6	45162.2	0.0	0.0
Fumarate, Maleate, & isoketovalerate_4-3	119875.9	93133.0	55948.3	56822.4	37693.6	42295.3
Sum	278758.3	152252.9	121425.9	101984.5	37693.6	42295.3
Phosphoenolpyruvate	24369.7	5019.5	0.0	0.0	0.0	0.0
Phosphoenolpyruvate_3-0	2247.4	697.6	4559.0	4777.9	9291.6	12005.1
Sum	26617.1	5717.0	4559.0	4777.9	9291.6	12005.1
Proline	189144.1	193880.4	133036.9	139590.7	129223.8	119670.4
Proline_5-4	0.0	1682.5	10420.2	34093.9	25495.8	36213.8
Sum	189144.1	195562.9	143457.1	173684.7	154719.5	155884.2
serine	42356.2	60437.4	62862.0	53647.6	58526.9	40018.4
Serine_2-1	0.0	0.0	0.0	5699.2	5181.9	2623.2

Serine_2-2	17391.1	12411.9	13796.3	15112.7	10374.9	9896.4
Serine_3-2	1058.6	1126.2	1704.3	3965.8	1760.6	2673.9
Sum	60805.8	73975.5	78362.5	78425.2	75844.3	55212.0
Succinate & Methylmalonate	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-0	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-2	86023.4	57945.4	44594.9	40968.0	27148.5	25642.8
Succinate & Methylmalonate_4-3	34339.3	57775.7	104085.6	120466.0	100512.3	115680.1
Sum	120362.7	115721.1	148680.5	161433.9	127660.8	141322.9
Threonine	26313.1	92615.8	56403.5	51209.4	49076.4	80213.9
Threonine_4-3	2263.9	1515.2	735.4	2838.1	677.2	0.0
Sum	28577.0	94130.9	57138.9	54047.5	49753.6	80213.9
Glutamate	5327395.1	2772105.1	581028.0	215396.5	111900.0	94708.5
Glutamate_3-2	66704.8	255836.5	513755.0	726167.4	733416.9	802416.6
Glutamate_3-3	101350.5	536407.0	708033.2	704726.6	603623.4	607753.6
Glutamate_5-4	133894.0	648546.0	1417848.2	2305925.0	2410477.4	2650890.9
Sum	5629344.4	4212894.5	3220664.2	3952215.5	3859417.7	4155769.6
Glutamine	752877.3	347190.1	59214.1	0.0	0.0	0.0
Glutamine 2-2	72961.8	132059.7	86134.5	34380.0	21317.5	15215.5
Glutamine 3-2	0.0	0.0	27681.9	46745.4	39785.3	31265.5
Glutamine 3-3	0.0	34932.2	42070.7	41028.1	27953.1	27811.9
Glutamine 5-4	1086.7	31972.8	83067.8	135608.8	154850.8	118445.5
Sum	826925.8	546154.9	298168.9	257762.3	243906.6	192738.3

Table S6. Flux area counts uninfected replicate 1 used in Figure 5 & Table 1

Component	240 min	245 min	255 min	270 min	300 min	360 min
5-methylthioadenosine	153198.7	162092.9	197769.9	130416.6	50404.9	18008.9
5-methylthioadenosine_1-0	8431.3	14952.1	76795.1	150825.6	78165.2	55832.1
5-methylthioadenosine_10-5	0.0	0.0	0.0	0.0	0.0	1149.7
5-methylthioadenosine_11-5	0.0	0.0	0.0	0.0	0.0	0.0
Sum	161630.0	177045.0	274565.0	281242.2	128570.1	74990.7
Acetyl-CoA	21165.3	33292.8	14004.1	4423.6	1370.6	338.0
Acetyl-CoA_2-2	176895.4	166427.8	101695.8	48377.3	59123.3	3253.4
Sum	198060.8	199720.6	115699.9	52801.0	60493.9	3591.4
alanine	45598.3	40586.0	0.0	0.0	0.0	0.0
Alanine_2-1	2216.2	21612.1	6736.1	9555.3	5084.7	2733.8
Alanine_2-2	0.0	16507.3	3563.5	4526.4	889.7	605.4
Alanine_3-2	3342.8	18325.3	7232.3	18306.2	19728.4	13530.0
Sum	51157.3	97030.7	17531.9	32387.9	25702.9	16869.2
Aspartate	67519.9	49584.5	0.0	0.0	0.0	0.0
Aspartate_2-2	1282.2	6061.9	4377.1	420.5	0.0	1371.9
Aspartate_4-2	122.9	1817.4	17819.0	27107.9	23723.1	18994.3
Sum	68925.0	57463.8	22196.1	27528.4	23723.1	20366.3
citrate & isocitrate	394120.0	94990.1	27844.0	10830.6	0.0	0.0
Citrate & IsoCitrate_2-1	434268.9	224838.2	57853.2	15774.9	5247.5	11171.4
Citrate & IsoCitrate_2-2	414737.3	277728.5	97503.6	23050.2	14662.7	30963.7
Citrate & IsoCitrate_6-5	16306.5	116547.3	219496.6	251030.9	254410.7	814921.2
Sum	1259432.6	714104.1	402697.3	300686.7	274321.0	857056.3
D-glucono-d-lactone-6-phosphate	22056.8	31172.9	20650.6	21159.1	33234.3	27449.4
D-Glucono-d-lactone-6-phosphate_6-0	0.0	0.0	0.0	0.0	461.3	0.0
Sum	22056.8	31172.9	20650.6	21159.1	33695.6	27449.4
Fumarate, maleate, & isoketovalerate	0.0	0.0	0.0	0.0	0.0	0.0
Fumarate, Maleate, & isoketovalerate_4-3	41172.5	25039.1	39915.4	34637.9	22109.0	23458.4
Sum	41172.5	25039.1	39915.4	34637.9	22109.0	23458.4
Phosphoenolpyruvate	18832.2	4740.3	0.0	0.0	0.0	0.0
Phosphoenolpyruvate_3-0	124.1	4764.1	4656.9	5530.4	716.7	7722.0
Sum	18956.3	9504.5	4656.9	5530.4	716.7	7722.0
Proline	194266.1	158817.6	116156.8	114481.3	119228.1	67204.3
Proline_5-4	6479.1	11163.9	7920.9	22337.1	25373.1	19261.0
Sum	200745.2	169981.5	124077.6	136818.3	144601.1	86465.3
serine	58509.8	34692.1	32372.9	39853.4	51802.4	31627.6
Serine_2-1	0.0	0.0	0.0	2646.3	3535.0	2832.6
Serine_2-2	7738.3	4634.6	11925.6	4626.0	5503.8	0.0
Serine_3-2	1185.3	5088.5	0.0	422.7	0.0	467.2
Sum	67433.3	44415.3	44298.4	47548.3	60841.3	34927.4
Succinate & Methylmalonate	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-0	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-2	23502.9	22521.1	22808.7	14383.7	17256.0	8473.6

Succinate & Methylmalonate_4-3	5476.3	40308.0	54884.2	103444.3	101230.1	83782.3
Sum	28979.2	62829.1	77692.9	117828.0	118486.1	92255.9
Threonine	79321.1	125448.0	56874.5	53561.3	69996.8	41342.1
Threonine_4-3	795.4	0.0	0.0	3255.6	1109.4	892.1
Sum	80116.5	125448.0	56874.5	56816.9	71106.2	42234.1
Glutamate	5179290.9	3347139.1	878558.4	241968.2	118602.8	93133.1
Glutamate_3-2	27674.5	197709.7	418675.4	760613.2	771088.6	774690.6
Glutamate_3-3	64670.1	553256.4	805176.3	784160.0	582232.8	653232.1
Glutamate_5-4	94070.2	731312.6	1786028.9	3274755.7	3883166.2	4409613.5
Sum	5365705.7	4829417.7	3888438.9	5061497.1	5355090.4	5930669.3
Glutamine	409450.6	288809.4	54694.8	0.0	0.0	0.0
Glutamine 2-2	21962.8	105812.3	75036.2	38371.5	16516.3	9252.4
Glutamine 3-2	0.0	0.0	0.0	33262.6	44610.3	35586.0
Glutamine 3-3	0.0	14665.7	25990.7	29517.8	29413.7	22610.8
Glutamine 5-4	0.0	18270.4	75936.5	183712.6	250282.4	212039.9
Sum	431413.3	427557.9	231658.2	284864.4	340822.7	279489.1

Table S7. Flux area counts uninfected replicate 2 used in Figure 5 & Table 1

Component	0 min	5 min	15 min	30 min	60 min	120 min
5-methylthioadenosine	158516.3	152292.6	108523.4	56509.3	23617.1	7081.3
5-methylthioadenosine_1-0	11147.4	24194.5	61661.8	65403.1	36787.5	12049.6
5-methylthioadenosine_10-5	0.0	0.0	0.0	0.0	1126.4	0.0
5-methylthioadenosine_11-5	0.0	0.0	0.0	0.0	0.0	0.0
Sum	169663.6	176487.1	170185.1	121912.5	61531.0	19131.0
Acetyl-CoA	14745.9	45926.9	24977.3	23467.8	21040.2	24501.4
Acetyl-CoA_2-2	73105.3	66941.2	75030.9	85326.2	78451.1	44121.4
Sum	87851.2	112868.1	100008.2	108794.0	99491.3	68622.9
alanine	23309.2	23233.1	0.0	0.0	0.0	0.0
Alanine_2-1	3302.9	4843.8	0.0	0.0	8631.7	9582.6
Alanine_2-2	4658.1	3595.3	2387.1	10259.6	2435.3	2688.3
Alanine_3-2	7275.8	7578.6	3038.5	4955.9	17154.2	7136.5
Sum	38546.0	39250.8	5425.5	15215.4	28221.2	19407.4
Aspartate	57333.1	29928.2	0.0	0.0	0.0	0.0
Aspartate_2-2	1777.3	7306.7	2285.1	1057.4	5249.6	4565.8
Aspartate_4-2	146.8	4010.4	18167.3	30892.1	18959.0	29185.5
Sum	59257.1	41245.4	20452.3	31949.4	24208.5	33751.2
citrate & isocitrate	51180.5	26720.6	0.0	0.0	0.0	0.0
Citrate & IsoCitrate_2-1	55753.8	26557.8	11542.1	0.0	3369.0	3523.4
Citrate & IsoCitrate_2-2	67402.0	30387.9	19279.2	9081.1	14466.5	13709.3
Citrate & IsoCitrate_6-5	1942.4	16652.8	72936.1	47973.0	79987.0	147158.0
Sum	176278.8	100319.1	103757.3	57054.0	97822.4	164390.6
D-glucono-d-lactone-6-phosphate	42312.6	39392.9	32078.8	42374.9	39123.3	34614.4
D-Glucono-d-lactone-6-phosphate_6-0	4034.8	4264.4	2081.9	0.0	744.5	2405.0
Sum	46347.4	43657.2	34160.7	42374.9	39867.8	37019.4
Fumarate, maleate, & isoketovalerate	110705.6	48288.4	51483.1	69095.7	0.0	0.0
Fumarate, Maleate, & isoketovalerate_4-3	101869.8	72622.1	73185.9	53075.6	38572.5	30329.7
Sum	212575.4	120910.5	124669.0	122171.3	38572.5	30329.7
Phosphoenolpyruvate	11944.7	1573.3	0.0	0.0	0.0	0.0
Phosphoenolpyruvate_3-0	6331.2	3004.4	3200.5	4450.6	10757.9	9801.5
Sum	18275.9	4577.7	3200.5	4450.6	10757.9	9801.5
Proline	147958.5	209766.8	188768.6	121902.0	107525.7	102372.6
Proline_5-4	0.0	1497.2	14597.6	24817.8	37450.0	45870.7
Sum	147958.5	211264.0	203366.3	146719.8	144975.7	148243.3
serine	103305.7	54160.3	42922.5	64323.0	56942.6	89206.6
Serine_2-1	0.0	0.0	0.0	317.8	4336.4	7272.1
Serine_2-2	12471.4	6112.2	15176.0	13195.3	12058.4	14447.2
Serine_3-2	1474.7	635.8	340.8	1378.7	0.0	2659.8
Sum	117251.8	60908.3	58439.4	79214.7	73337.3	113585.6
Succinate & Methylmalonate	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-0	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-2	59519.9	46254.4	48792.2	28961.6	37745.9	23352.0

Succinate & Methylmalonate_4-3	21192.3	49980.7	84767.4	93023.5	94793.3	101122.8
Sum	80712.3	96235.1	133559.6	121985.1	132539.2	124474.8
Threonine	15852.8	43379.1	57869.0	49364.1	90326.3	71732.0
Threonine_4-3	899.1	1132.3	2029.8	4378.5	2727.3	3009.8
Sum	16751.9	44511.3	59898.8	53742.6	93053.6	74741.8
Glutamate	5211805.9	2589178.2	726447.5	192023.8	110750.0	81477.3
Glutamate_3-2	70343.3	248603.4	593311.8	698165.0	717465.5	748310.7
Glutamate_3-3	141283.2	517698.5	817967.7	670801.7	562000.4	577911.2
Glutamate_5-4	139085.1	664291.4	1701145.7	2252453.2	2293559.7	2545615.9
Sum	5562517.3	4019771.5	3838872.6	3813443.7	3683775.6	3953315.1
Glutamine	715243.8	329670.9	61527.9	0.0	0.0	0.0
Glutamine 2-2	68252.2	159273.7	81500.9	34991.9	18776.6	11222.1
Glutamine 3-2	0.0	0.0	29872.6	42496.8	26617.7	42284.0
Glutamine 3-3	0.0	34347.3	45519.5	49378.9	27846.5	26903.6
Glutamine 5-4	1179.2	36953.3	105701.5	127000.8	120870.3	119373.0
Sum	784675.2	560245.3	324122.4	253868.3	194111.2	199782.8

Table S8. Flux area counts uninfected replicate 2 used in Figure 5 & Table 1

Component	240 min	245 min	255 min	270 min	300 min	360 min
5-methylthioadenosine	143980.1	142769.1	185758.1	123448.8	72189.3	19774.3
5-methylthioadenosine_1-0	8616.9	9392.2	73202.5	142058.6	101281.4	47585.4
5-methylthioadenosine_10-5	0.0	0.0	0.0	0.0	0.0	1637.3
5-methylthioadenosine_11-5	0.0	0.0	0.0	0.0	0.0	729.7
Sum	152597.0	152161.3	258960.7	265507.5	173470.7	69726.8
Acetyl-CoA	43010.2	38427.8	2965.1	9333.2	2627.7	1306.9
Acetyl-CoA_2-2	130278.8	107241.3	41264.3	33165.3	45864.8	1692.1
Sum	173288.9	145669.1	44229.4	42498.5	48492.5	2999.0
alanine	28578.7	22484.9	0.0	0.0	0.0	0.0
Alanine_2-1	0.0	11259.4	0.0	1438.9	3027.6	3541.5
Alanine_2-2	2888.0	8961.2	1684.7	909.2	3857.5	4490.0
Alanine_3-2	7046.3	15632.0	9481.8	3696.5	17316.7	14881.7
Sum	38513.0	58337.5	11166.5	6044.6	24201.8	22913.2
Aspartate	52104.7	9777.8	0.0	0.0	0.0	0.0
Aspartate_2-2	1474.1	1586.2	1320.2	2372.3	825.1	0.0
Aspartate_4-2	1413.9	744.0	11292.3	9150.1	35064.0	16700.4
Sum	54992.7	12108.1	12612.5	11522.4	35889.1	16700.4
citrate & isocitrate	353038.5	98063.9	32368.2	17038.4	0.0	0.0
Citrate & IsoCitrate_2-1	390022.7	229751.2	79902.9	23870.0	7187.7	6984.8
Citrate & IsoCitrate_2-2	374904.8	219474.5	103711.5	32369.7	15346.2	27026.2
Citrate & IsoCitrate_6-5	11201.9	91104.0	250521.0	367292.4	293733.2	646916.4
Sum	1129167.9	638393.6	466503.6	440570.5	316267.1	680927.4
D-glucono-d-lactone-6-phosphate	26600.0	31148.9	42038.2	41606.5	27059.0	18558.5
D-Glucono-d-lactone-6-phosphate_6-0	0.0	0.0	1356.4	3474.2	692.0	0.0
Sum	26600.0	31148.9	43394.6	45080.7	27751.0	18558.5
Fumarate, maleate, & isoketovalerate	65725.4	0.0	0.0	0.0	0.0	0.0
Fumarate, Maleate, & isoketovalerate_4-3	38120.8	36834.4	31537.6	46945.3	30974.3	23522.0
Sum	103846.2	36834.4	31537.6	46945.3	30974.3	23522.0
Phosphoenolpyruvate	8257.6	2068.2	0.0	0.0	0.0	0.0
Phosphoenolpyruvate_3-0	168.3	3311.2	4632.4	5072.6	2779.8	1316.2
Sum	8425.8	5379.4	4632.4	5072.6	2779.8	1316.2
Proline	128435.2	126729.8	135653.5	123575.4	98901.3	54732.9
Proline_5-4	0.0	1042.7	8643.4	36563.8	42694.1	33066.0
Sum	128435.2	127772.4	144296.9	160139.2	141595.4	87798.9
serine	50748.3	44077.2	34570.0	72075.8	48489.9	34695.2
Serine_2-1	0.0	0.0	0.0	0.0	1652.0	2691.1
Serine_2-2	5804.6	2634.3	1057.1	6714.5	9137.6	3097.2
Serine_3-2	1245.4	432.4	2097.9	0.0	219.6	193.0
Sum	57798.2	47143.9	37725.0	78790.3	59499.1	40676.5
Succinate & Methylmalonate	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-0	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-2	25699.9	33144.9	23683.1	24059.3	10998.7	8289.1

Succinate & Methylmalonate_4-3	9074.0	26226.1	63088.8	91489.6	72142.8	71809.2
Sum	34773.9	59371.0	86771.9	115548.9	83141.5	80098.3
Threonine	76620.3	71305.0	66002.1	68218.8	65318.2	42348.3
Threonine_4-3	6565.0	1624.4	709.8	2706.2	1732.3	0.0
Sum	83185.3	72929.3	66711.9	70925.0	67050.5	42348.3
Glutamate	4416467.1	3118831.7	941178.0	181220.3	135210.9	76871.1
Glutamate_3-2	28204.9	213603.8	474061.1	578856.2	835118.7	924588.9
Glutamate_3-3	51812.2	538674.6	916727.4	660313.6	713301.2	745356.5
Glutamate_5-4	74325.9	689282.3	1815687.6	2733908.0	4375963.7	4882380.1
Sum	4570810.1	4560392.4	4147654.1	4154298.1	6059594.5	6629196.6
Glutamine	357311.1	228578.2	57909.2	0.0	0.0	0.0
Glutamine 2-2	14670.8	93856.7	78488.1	27011.2	17387.6	12435.1
Glutamine 3-2	0.0	0.0	0.0	35165.1	45003.0	50129.4
Glutamine 3-3	0.0	12572.1	35408.4	32456.9	31687.0	25330.4
Glutamine 5-4	0.0	17078.0	87821.5	171243.8	246622.6	259122.3
Sum	371981.9	352085.0	259627.2	265877.0	340700.2	347017.2

Table S9. Flux area counts infected replicate 1 used in Figure 5 & Table 1

Component	0 min	5 min	15 min	30 min	60 min	120 min
5-methylthioadenosine	124862.6	123381.9	109508.9	67985.4	24536.0	17065.0
5-methylthioadenosine_1-0	9016.4	11788.6	64806.9	64247.0	30013.5	34804.5
5-methylthioadenosine_10-5	0.0	0.0	0.0	0.0	0.0	1164.8
5-methylthioadenosine_11-5	0.0	0.0	0.0	0.0	0.0	0.0
Sum	133879.1	135170.5	174315.8	132232.4	54549.6	53034.3
Acetyl-CoA	1101.6	23347.2	36741.7	19802.1	33584.5	15057.5
Acetyl-CoA_2-2	3957.8	73489.1	106940.7	82123.6	108216.4	47729.9
Sum	5059.4	96836.3	143682.4	101925.6	141800.8	62787.4
alanine	163149.6	50622.7	0.0	0.0	0.0	0.0
Alanine_2-1	10048.8	26405.8	0.0	0.0	0.0	2558.4
Alanine_2-2	6643.5	14013.5	1440.5	3666.3	1440.7	2405.1
Alanine_3-2	31165.3	14326.0	1585.8	5418.8	10534.9	4631.9
Sum	211007.1	105368.0	3026.3	9085.1	11975.7	9595.4
Aspartate	67276.0	51228.3	0.0	0.0	0.0	0.0
Aspartate_2-2	0.0	4691.4	1121.0	3602.6	4387.6	1279.2
Aspartate_4-2	3030.6	9098.2	14814.3	14066.1	26672.0	33616.3
Sum	70306.6	65017.9	15935.4	17668.6	31059.6	34895.5
citrate & isocitrate	49181.9	26564.6	22487.1	0.0	0.0	0.0
Citrate & IsoCitrate_2-1	90916.7	53445.8	19602.7	4253.8	5498.8	6469.0
Citrate & IsoCitrate_2-2	102861.9	62326.7	37002.4	10197.5	15010.7	20551.2
Citrate & IsoCitrate_6-5	7362.4	21035.3	78374.9	105079.9	123058.6	141765.2
Sum	250323.0	163372.3	157467.0	119531.1	143568.1	168785.4
D-glucono-d-lactone-6-phosphate	46809.8	32370.0	38062.9	32152.9	43874.1	33990.8
D-Glucono-d-lactone-6-phosphate_6-0	0.0	3099.4	0.0	1717.3	3460.3	2029.6
Sum	46809.8	35469.5	38062.9	33870.2	47334.4	36020.4
Fumarate, maleate, & isoketovalerate	125987.8	84464.8	89563.5	63839.9	0.0	0.0
Fumarate, Maleate, & isoketovalerate_4-3	164552.6	65595.4	64580.6	72086.1	45107.7	42249.6
Sum	290540.4	150060.2	154144.1	135926.0	45107.7	42249.6
Phosphoenolpyruvate	24082.7	4388.8	0.0	0.0	0.0	0.0
Phosphoenolpyruvate_3-0	2953.7	2907.5	2586.0	4213.1	6318.2	3129.2
Sum	27036.4	7296.3	2586.0	4213.1	6318.2	3129.2
Proline	288923.7	265761.3	137114.0	161411.7	99982.6	112570.8
Proline_5-4	4022.6	2422.6	20728.8	20132.0	28350.8	27041.9
Sum	292946.3	268183.9	157842.8	181543.7	128333.5	139612.7
serine	61518.2	81712.1	81142.7	50342.6	82623.8	58615.0
Serine_2-1	0.0	0.0	0.0	0.0	5422.1	3504.6
Serine_2-2	7262.6	15542.0	15369.8	16933.6	10180.6	11966.0
Serine_3-2	4455.2	7088.5	4360.8	3350.5	10361.7	0.0
Sum	73236.0	104342.6	100873.3	70626.8	108588.2	74085.6
Succinate & Methylmalonate	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-0	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-2	106602.7	54783.8	37575.1	34396.6	27465.3	12061.7

Succinate & Methylmalonate_4-3	42886.9	52731.6	70035.2	99764.9	109615.2	84022.9
Sum	149489.5	107515.4	107610.3	134161.5	137080.5	96084.6
Threonine	31070.4	73173.5	62061.6	50684.0	59520.7	74444.4
Threonine_4-3	3620.2	2207.5	1344.4	7011.3	2359.6	4075.6
Sum	34690.6	75381.0	63405.9	57695.3	61880.3	78520.0
Glutamate	5231996.5	3136477.5	774921.2	226827.4	121665.7	97929.3
Glutamate_3-2	114059.7	284855.4	538428.8	675075.3	757215.7	814440.4
Glutamate_3-3	204087.3	632629.5	756188.4	663016.3	654822.5	647362.3
Glutamate_5-4	200425.4	632573.4	1500485.0	2060339.5	2532315.7	2625710.3
Sum	5750568.9	4686535.9	3570023.3	3625258.5	4066019.5	4185442.2
Glutamine	558754.4	374320.5	75131.1	0.0	0.0	0.0
Glutamine 2-2	51151.5	141405.4	83110.8	44194.2	36880.4	36457.7
Glutamine 3-2	0.0	0.0	23872.5	42620.3	64194.5	68661.9
Glutamine 3-3	0.0	34002.6	58062.0	44522.9	43603.0	63728.7
Glutamine 5-4	1275.5	27627.9	104442.3	168348.4	195540.4	242448.4
Sum	611181.4	577356.3	344618.6	299685.8	340218.3	411296.7

Table S10. Flux area counts infected replicate 1 used in Figure 5 & Table 1

Component	240 min	245 min	255 min	270 min	300 min	360 min
5-methylthioadenosine	166812.3	158549.5	171044.5	225483.4	161722.3	81389.2
5-methylthioadenosine_1-0	8546.9	18683.8	52343.4	134338.9	122684.2	74309.2
5-methylthioadenosine_10-5	0.0	0.0	0.0	0.0	0.0	769.2
5-methylthioadenosine_11-5	0.0	0.0	0.0	0.0	0.0	0.0
Sum	175359.1	177233.3	223387.9	359822.3	284406.5	156467.5
Acetyl-CoA	48461.4	23762.2	14139.8	7749.2	1950.3	555.7
Acetyl-CoA_2-2	131106.8	114107.3	80099.4	66681.2	16806.0	3561.2
Sum	179568.2	137869.5	94239.2	74430.4	18756.4	4116.8
alanine	0.0	16056.4	0.0	0.0	0.0	0.0
Alanine_2-1	2936.6	0.0	2687.1	0.0	3341.0	6900.1
Alanine_2-2	1655.5	2549.4	1140.3	0.0	2843.3	0.0
Alanine_3-2	2813.0	6839.4	2895.8	12874.5	19070.8	20438.6
Sum	7405.1	25445.2	6723.3	12874.5	25255.1	27338.7
Aspartate	69056.4	27650.9	13759.2	0.0	0.0	0.0
Aspartate_2-2	475.2	3658.0	3723.5	4987.6	4633.4	428.6
Aspartate_4-2	390.5	2882.0	1855.2	18795.8	22322.1	18051.4
Sum	69922.1	34190.9	19337.9	23783.5	26955.5	18480.0
citrate & isocitrate	81515.5	54466.7	30377.1	9748.0	0.0	0.0
Citrate & IsoCitrate_2-1	105174.6	89973.0	35980.4	11158.0	5011.2	0.0
Citrate & IsoCitrate_2-2	116238.3	89544.1	40769.9	23238.4	10247.6	2479.0
Citrate & IsoCitrate_6-5	10167.4	26844.1	85621.5	86359.2	92804.8	109398.9
Sum	313095.8	260827.9	192748.8	130503.7	108063.5	111877.9
D-glucono-d-lactone-6-phosphate	24643.0	30453.1	48977.5	30016.7	31390.8	34358.1
D-Glucono-d-lactone-6-phosphate_6-0	1575.8	2676.2	3352.7	4313.8	0.0	0.0
Sum	26218.8	33129.3	52330.2	34330.5	31390.8	34358.1
Fumarate, maleate, & isoketovalerate	50565.8	0.0	0.0	0.0	0.0	0.0
Fumarate, Maleate, & isoketovalerate_4-3	30382.3	27556.8	37907.1	21629.1	30739.4	22965.3
Sum	80948.0	27556.8	37907.1	21629.1	30739.4	22965.3
Phosphoenolpyruvate	2381.6	567.7	0.0	0.0	0.0	0.0
Phosphoenolpyruvate_3-0	416.8	444.4	896.7	2014.8	236.4	307.6
Sum	2798.4	1012.0	896.7	2014.8	236.4	307.6
Proline	219254.8	193459.6	148273.6	170123.1	117207.1	125464.1
Proline_5-4	0.0	5923.5	7890.6	24526.2	24369.7	35410.7
Sum	219254.8	199383.0	156164.2	194649.3	141576.8	160874.8
serine	61393.4	44333.1	79842.8	50193.3	52975.8	44632.0
Serine_2-1	0.0	0.0	0.0	0.0	2669.2	573.8
Serine_2-2	7993.4	4158.7	7018.4	6276.8	2382.3	2488.2
Serine_3-2	2175.9	4255.8	0.0	798.7	480.1	69.4
Sum	71562.7	52747.6	86861.2	57268.8	58507.4	47763.4
Succinate & Methylmalonate	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-0	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-2	16074.3	12266.5	15201.8	15269.5	4804.7	5662.5

Succinate & Methylmalonate_4-3	0.0	19858.6	33838.6	44496.2	48266.3	35196.2
Sum	16074.3	32125.1	49040.4	59765.6	53071.0	40858.7
Threonine	55210.9	70647.3	76303.0	74699.3	49322.0	41615.5
Threonine_4-3	1438.0	2126.6	584.3	443.4	4536.2	329.1
Sum	56648.9	72773.9	76887.3	75142.7	53858.2	41944.6
Glutamate	4285578.3	2751610.2	997786.2	472408.5	201476.9	169561.8
Glutamate_3-2	48779.7	205113.0	348388.8	711855.8	795945.9	964528.3
Glutamate_3-3	125743.7	457666.3	582784.7	868603.0	759270.0	773106.2
Glutamate_5-4	111448.9	562810.3	1167410.4	2750482.5	3045301.6	4048260.1
Sum	4571550.6	3977199.7	3096370.1	4803349.7	4801994.3	5955456.4
Glutamine	700975.5	553670.3	201040.8	86589.0	32354.6	9240.9
Glutamine 2-2	32232.0	122550.8	130677.4	163043.3	79571.9	62388.0
Glutamine 3-2	0.0	0.0	29520.3	77244.3	97374.5	109578.1
Glutamine 3-3	0.0	23160.9	48607.5	107044.9	95261.4	78030.0
Glutamine 5-4	0.0	28901.0	83203.6	351452.0	352528.7	460080.1
Sum	733207.5	728283.0	493049.5	785373.5	657091.1	719317.1

Table S11. Flux area counts infected replicate 2 used in Figure 5 & Table 1

Component	0 min	5 min	15 min	30 min	60 min	120 min
5-methylthioadenosine	161039.2	134495.1	110085.0	68928.1	16136.7	10971.4
5-methylthioadenosine_1-0	6002.7	16914.8	68672.5	74141.3	35490.7	15258.6
5-methylthioadenosine_10-5	0.0	0.0	0.0	0.0	555.3	361.5
5-methylthioadenosine_11-5	0.0	0.0	0.0	0.0	0.0	0.0
Sum	167041.9	151409.9	178757.5	143069.4	52182.8	26591.5
Acetyl-CoA	28796.5	30334.6	32962.6	39020.5	26558.1	23016.9
Acetyl-CoA_2-2	89075.7	81524.5	85651.0	77677.4	96325.3	52406.8
Sum	117872.1	111859.1	118613.5	116697.8	122883.4	75423.7
alanine	149096.2	54197.2	0.0	0.0	0.0	0.0
Alanine_2-1	11479.2	29543.6	8055.2	0.0	13272.5	10410.5
Alanine_2-2	8381.3	10625.5	0.0	0.0	2599.6	4540.2
Alanine_3-2	16163.8	17395.8	7441.9	6965.8	29502.5	18593.3
Sum	185120.5	111762.2	15497.1	6965.8	45374.6	33544.0
Aspartate	92679.6	53299.2	0.0	0.0	0.0	0.0
Aspartate_2-2	5771.0	12258.8	5464.4	578.0	6641.8	4600.3
Aspartate_4-2	0.0	659.6	14400.2	19141.8	32600.4	38835.3
Sum	98450.5	66217.6	19864.6	19719.8	39242.2	43435.5
citrate & isocitrate	43523.9	27228.2	0.0	0.0	0.0	0.0
Citrate & IsoCitrate_2-1	67597.5	38467.5	10011.9	3081.6	1627.1	3769.5
Citrate & IsoCitrate_2-2	58792.5	61024.0	20231.1	3832.8	6717.9	18736.8
Citrate & IsoCitrate_6-5	1195.2	16335.7	41349.6	63337.5	65690.8	142478.3
Sum	171109.1	143055.4	71592.5	70251.8	74035.8	164984.6
D-glucono-d-lactone-6-phosphate	35425.0	38524.3	24600.9	33042.7	41390.9	34237.5
D-Glucono-d-lactone-6-phosphate_6-0	2872.7	2076.3	5275.6	2951.3	2737.9	972.5
Sum	38297.7	40600.6	29876.5	35993.9	44128.8	35210.0
Fumarate, maleate, & isoketovalerate	130795.3	76734.1	56455.0	43754.4	0.0	0.0
Fumarate, Maleate, & isoketovalerate_4-3	79488.9	77407.5	41480.7	54178.6	34457.3	38858.8
Sum	210284.2	154141.6	97935.7	97933.0	34457.3	38858.8
Phosphoenolpyruvate	21137.9	9892.2	0.0	0.0	0.0	0.0
Phosphoenolpyruvate_3-0	280.2	4248.1	5303.5	1302.5	5541.0	13260.4
Sum	21418.1	14140.2	5303.5	1302.5	5541.0	13260.4
Proline	165794.8	210058.4	180321.6	150521.7	119560.2	117683.6
Proline_5-4	2670.6	5155.2	15492.9	34452.1	61436.3	50927.7
Sum	168465.3	215213.6	195814.5	184973.8	180996.5	168611.2
serine	80222.2	42722.4	55034.4	64725.6	61749.3	40966.5
Serine_2-1	0.0	0.0	0.0	0.0	2038.9	3495.5
Serine_2-2	20495.6	18947.6	9534.7	13058.8	6150.9	7052.0
Serine_3-2	1573.2	2047.4	594.0	2509.6	1733.8	1025.6
Sum	102291.1	63717.4	65163.1	80294.0	71672.9	52539.6
Succinate & Methylmalonate	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-0	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-2	57185.2	66961.2	30339.0	29121.7	22228.7	18158.4

Succinate & Methylmalonate_4-3	15299.3	60712.7	94483.1	105962.6	97993.8	85248.9
Sum	72484.5	127673.9	124822.1	135084.3	120222.5	103407.3
Threonine	19499.4	75395.0	57593.3	51349.2	65515.0	68983.3
Threonine_4-3	0.0	1505.5	3791.1	0.0	3020.4	1358.9
Sum	19499.4	76900.6	61384.4	51349.2	68535.4	70342.2
Glutamate	6329951.8	2981100.8	912785.0	262627.9	133368.6	115271.5
Glutamate_3-2	85480.3	309336.2	632942.5	746008.1	888743.9	845626.3
Glutamate_3-3	159353.6	610728.4	912641.0	782689.2	715418.3	681315.9
Glutamate_5-4	134917.6	633870.2	1839395.2	2378284.1	2830633.8	2967730.0
Sum	6709703.2	4535035.5	4297763.6	4169609.3	4568164.6	4609943.7
Glutamine	1055219.0	438814.0	94258.0	0.0	0.0	0.0
Glutamine 2-2	88765.6	147579.1	115650.2	60200.4	46078.5	40728.3
Glutamine 3-2	0.0	0.0	55756.7	66461.7	83850.0	80648.4
Glutamine 3-3	0.0	41237.6	62696.7	63073.9	54849.1	50578.4
Glutamine 5-4	603.2	22259.7	140133.0	210448.5	275289.7	262904.2
Sum	1144587.7	649890.4	468494.6	400184.5	460067.3	434859.3

Table S12. Flux area counts infected replicate 2 used in Figure 5 & Table 1

Component	240 min	245 min	255 min	270 min	300 min	360 min
5-methylthioadenosine	214249.4	201269.7	307553.2	229236.6	186719.6	63747.3
5-methylthioadenosine_1-0	9929.9	17274.3	73372.0	122725.1	128307.0	50841.9
5-methylthioadenosine_10-5	0.0	0.0	0.0	0.0	0.0	433.0
5-methylthioadenosine_11-5	0.0	0.0	0.0	0.0	0.0	0.0
Sum	224179.3	218544.0	380925.2	351961.7	315026.7	115022.2
Acetyl-CoA	27507.3	19212.0	20675.9	11997.3	3081.4	360.3
Acetyl-CoA_2-2	100992.2	113562.2	97295.8	45457.7	32165.8	4756.4
Sum	128499.5	132774.2	117971.7	57455.1	35247.2	5116.8
alanine	54958.7	49763.4	0.0	0.0	0.0	0.0
Alanine_2-1	0.0	22928.1	12899.8	6566.8	16731.0	16905.7
Alanine_2-2	2722.6	19790.1	1136.2	7913.0	16365.4	687.0
Alanine_3-2	9461.9	18643.1	16101.8	31479.9	52659.8	25047.7
Sum	67143.1	111124.7	30137.8	45959.7	85756.2	42640.3
Aspartate	60485.7	54727.3	0.0	0.0	0.0	0.0
Aspartate_2-2	12830.8	3862.4	680.8	3388.3	6905.6	886.2
Aspartate_4-2	1832.7	5258.7	18233.2	16036.0	30085.2	13359.4
Sum	75149.2	63848.4	18914.0	19424.3	36990.8	14245.6
citrate & isocitrate	145232.4	80870.3	18210.4	0.0	0.0	0.0
Citrate & IsoCitrate_2-1	193550.7	162159.8	43164.2	6102.3	3928.1	2533.3
Citrate & IsoCitrate_2-2	173930.0	156935.2	50303.1	20801.2	9934.9	11292.2
Citrate & IsoCitrate_6-5	10971.5	67479.3	109132.5	124587.3	97057.0	142281.8
Sum	523684.6	467444.5	220810.1	151490.7	110920.1	156107.3
D-glucono-d-lactone-6-phosphate	25127.0	32219.8	22602.6	32143.6	19515.6	25867.3
D-Glucono-d-lactone-6-phosphate_6-0	0.0	6123.5	0.0	0.0	0.0	0.0
Sum	25127.0	38343.3	22602.6	32143.6	19515.6	25867.3
Fumarate, maleate, & isoketovalerate	71049.1	0.0	0.0	0.0	0.0	0.0
Fumarate, Maleate, & isoketovalerate_4-3	22287.4	35398.9	21557.7	14482.9	8071.7	15175.0
Sum	93336.5	35398.9	21557.7	14482.9	8071.7	15175.0
Phosphoenolpyruvate	5625.6	1466.5	0.0	0.0	0.0	0.0
Phosphoenolpyruvate_3-0	69.1	781.0	367.8	4495.4	462.8	1152.2
Sum	5694.7	2247.5	367.8	4495.4	462.8	1152.2
Proline	213378.9	227314.2	147672.0	132367.5	191356.3	101935.2
Proline_5-4	351.0	417.8	16419.9	28527.4	40648.1	42025.3
Sum	213729.9	227732.0	164091.9	160894.9	232004.4	143960.5
serine	74924.5	66745.2	56119.4	59621.6	34837.6	36579.9
Serine_2-1	0.0	0.0	0.0	1121.4	939.1	341.2
Serine_2-2	6557.7	1954.9	5619.9	3614.7	5495.5	2332.0
Serine_3-2	0.0	0.0	1010.3	1164.0	139.2	0.0
Sum	81482.2	68700.2	62749.6	65521.7	41411.4	39253.1
Succinate & Methylmalonate	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-0	0.0	0.0	0.0	0.0	0.0	0.0
Succinate & Methylmalonate_2-2	17892.9	23708.0	16825.8	16897.0	11842.4	7802.9

Succinate & Methylmalonate_4-3	7598.4	28769.3	41624.4	50706.9	42574.8	47975.8
Sum	25491.3	52477.3	58450.2	67603.9	54417.2	55778.7
Threonine	56742.2	73042.8	58697.8	60009.1	49610.7	26761.7
Threonine_4-3	0.0	4278.5	3184.5	0.0	0.0	0.0
Sum	56742.2	77321.3	61882.3	60009.1	49610.7	26761.7
Glutamate	5634976.3	3522042.8	1470284.7	503408.9	272266.6	156101.6
Glutamate_3-2	53385.8	236407.7	511671.2	797661.2	1100264.3	1032744.5
Glutamate_3-3	135917.6	510493.4	931366.1	983408.4	955989.2	828600.7
Glutamate_5-4	148781.6	693857.2	1751552.5	3248832.9	4278689.9	4367315.4
Sum	5973061.3	4962801.0	4664874.5	5533311.2	6607210.0	6384762.2
Glutamine	893948.0	649945.1	321380.1	125459.9	43196.7	22836.4
Glutamine 2-2	55750.7	180078.5	239401.5	183150.8	130253.4	66954.7
Glutamine 3-2	0.0	0.0	49258.6	117383.9	161374.7	143662.9
Glutamine 3-3	0.0	31838.7	80970.2	161248.4	145233.0	99070.6
Glutamine 5-4	0.0	31370.3	155959.7	437469.3	630324.6	542002.6
Sum	949698.7	893232.6	846970.1	1024712.4	1110382.3	874527.1