

**Table S3.** Novel putative enzymes annotated onto the *M. gallisepticum* metabolic map in this study.

Enzyme name	Enzyme abbr.	EC number	Gene number	Pathway	Equation	Evidence
a. Phosphoglucomutase	PGM	5.4.2.2	MGA_0358	Glycolysis	$\alpha\text{-D-glucose 1-phosphate} = \text{D-glucose 6-phosphataphate}$	1) Ortholog of <i>M. pneumoniae</i> MPN066
	DeoB	5.4.2.7	MGA_0358	Pentose phosphate pathway	$\text{D-ribose-1-phosphate} = \text{D-ribose-5-phosphate}$	1) Ortholog of <i>M. pneumoniae</i> MPN066 2) Reaction was annotated in <i>M. pneumoniae</i> MPN0622
b. Ribose ABC transporter	RibABC	-	MGA_0365 MGA_0368 MGA_0372	Ribose uptake	$\text{Ribose (out)} + \text{ATP} = \text{Ribose (in)} + \text{ADP} + \text{phosphate}$	1) Ortholog of <i>M. pneumoniae</i> MPN258-260 (1) 2) Sequence homology (Fig. S2) 3) Conserved domain search
c. Dihydroxyacetone kinase	DHAK	-	MGA_0183		$\text{Glycerone} + \text{ATP} = \text{Glycerone phosphate} + \text{ADP}$	1) Ortholog of <i>M. pneumoniae</i> MPN547 2) Sequence homology (Fig. S2) 3) Biocyc database search 4) Conserved domain search
d. Nucleoside diphosphate kinase	NDK	2.7.4.6	MGA_0156	Pyrimidine metabolism	$\text{ATP} + \text{nucleoside diphosphate} = \text{ADP} + \text{nucleoside triphosphate}$	1) Ortholog of <i>M. pneumoniae</i> MPN303
e. Uridine phosphorylase	UDP	2.4.2.3	MGA_0362	Pyrimidine metabolism	$\text{Uridine} + \text{phosphate} = \text{uracil} + \alpha\text{-D-ribose 1-phosphate}$	1) Ortholog of <i>M. pneumoniae</i> MPN064 2) Conserved domain search 3) BioCyc database search 4) Enzymatic activity (1, 8, 12)
f. Malate dehydrogenase	MDH	1.1.1.37	MGA_0746	TCA cycle	$(\text{S})\text{-malate} + \text{NAD}^+ = \text{oxaloacetate} + \text{NADH} + \text{H}^+$	1) Ortholog of <i>E. coli</i> MDH 2) Protein structure prediction Phyre2 3) BioCyc database search
g. Glycerol uptake facilitator protein	GlpF	-	MGA_0641	Glycerol uptake	$\text{Glycerol (out)} = \text{Glycerol (in)}$	1) Ortholog of <i>M. pneumoniae</i> GlpF MPN043
h. sn-glycerol-3-phosphate ABC transport system	UGP C, A, E	-	MGA_0677 MGA_0680 MGA_0682	sn-glycerol 3-phosphate uptake	$\text{Glycerol 3-phosphate (out)} + \text{ATP} = \text{Glycerol 3-phosphate (in)} + \text{ADP} + \text{phosphate}$	1) Orthologs with MPN133-136 2) Genomic context

i. Glycosyl transferase	GTF	2.4.1.157	MGA_0343	Glycerolipid metabolism	Diacylglycerol + UDP-glucose = 3-D-glucosyl-1,2 diacyl-sn-glycerol + UDP	1) Ortholog of <i>M. pneumoniae</i> yibD MPN483 2) Enzymatic activity (1, 7)
j. Phosphatidylcholine acylhydrolase	PLDB	3.1.1.5	MGA_0999	Lipid metabolism	Phosphatidylcholine + 2 H <sub>2</sub> O = sn-glycero 3 phosphocholine + 2 fatty acid	1) Ortholog of <i>M. pneumoniae</i> MPN445
k. Choline ethanolamine kinase	CHK	2.7.1.32	MGA_0931	Glycerophospho lipid metabolism	Choline + ATP = Choline-phosphate + ADP	1) Ortholog of <i>M. pneumoniae</i> MPN532 2) Conserved domain search
l. Choline-phosphate cytidyltransferase	PCT	2.7.7.15	MGA_0052	Glycerophospho lipid metabolism	Choline-phosphate + CTP = CDP-choline + Diphosphate	1) Ortholog of <i>M. pneumoniae</i> MPN336 2) Conserved domain search
m. Amino acid permease	-	-	MGA_0287	Amino acid uptake	Amino acid (out) = amino acid (in)	1) BioCyc database search 2) Conserved domain search
n. NAD <sup>+</sup> kinase	NADK	2.7.1.23	MGA_0291	Nicotinate and Nicotinamide metabolism	NADH + ATP = NADPH + ADP	1) Ortholog of MPN267 2) Enzymatic activity (1,9)
o. Riboflavine kinase	RFK	2.7.1.26	MGA_0832	Riboflavin metabolism	ATP + FMN + H <sup>+</sup> = FAD + diphosphate Riboflavin + ATP = ADP + FMN + H <sup>+</sup>	1) BioCyc database search 2) Conserved domain search
p. Pantetheine phosphate adenyltransferase	COASY	2.7.7.3	MGA_0052	Pantothenate and CoA biosynthesis	ATP + pantetheine 4'-phosphate = diphosphate + 3'-dephospho-CoA	1) Ortholog of <i>M. pneumoniae</i> MPN336 2) Conserved domain search
q. Acyl carrier protein (ACP) phosphodiesterase	ACPH	3.1.4.14	MGA_0243	Pantothenate and CoA biosynthesis	Acyl-carrier protein + H <sub>2</sub> O = Pantetheine 4'-phosphate + Apo-[acyl-carrier-protein]	1) Ortholog of <i>M. pneumoniae</i> MPN479 2) Conserved domain search

**TEXT 1.** Reference list for Tables S2 and S3.

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