## **Mutualistic**

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ilvA – threonine deaminase –	П	
eda – 2-keto-3-deoxygluconate 6-phosphate aldolase -	4	
pdxA – NAD-dependent dehydrogenase/carboxylase -	4	
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pgi – glucosephosphate isomerase –	1	
cysD - ATP-sulfurylase, subunit 1 -	11	
pfkA – 6-phosphofructokinase I -	11	
gpmA – phosphoglyceromutase 1 -	11	
argĎ – acetylornithine transaminase -	41	
glnG – EBP family response regulator in two-component regulatory system with GlnL-	41	
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galT – galactose–1–phosphate uridylyltransferase -	1	
ppc – phosphoenolpyruvate carboxylase -	11	
panC – pantothenate synthetase –	11	
galK – galactokinase -	Н	
cysN – ATP-sulfurylase, subunit 1 -	41	
nadC – quinolinate phosphoribosyltransferase -	11	
	H	
nadA – quinolinate synthetase, A protein –	1	
nadB – quinolinate synthetase, B protein -	11	
thiD – hydroxy–phosphomethylpyrimidine kinase (HMP–P kinase) -	11	
galE – UDP-galactose 4-epimerase -	41	
panB – 3-methyl-2-oxobutanoate hydroxymethyltransferase -	41	
xseA – exonuclease VII, large subunit -	╛	
sodA – superoxide dismutase -	1	
cysG – siroheme synthase –	11	
galP – MFS family galactose:proton symporter -	Ηl	
pabB – p–aminobenzoate synthetase, component I –	1	
glnL – sensory kinase (phosphatase) in two-component regulatory system with GlnG (nitrogen regulator II, NRII)	1	
ilvC – ketol–acid reductoisomerase	11	
	Jŀ	
ppk – polyphosphate kinase -	11	
panE – ketopantoate reductase -	11	
argE – acetylornithine deacetylase –	Н	
ilvG – acetolactate synthase II, large subunit -	41	
pabC – 4–amino–4–deoxychorismate lyase -	11	
	╟	
speB – agmatinase -	14	
zwf – glucose–6–phosphate dehydrogenase -	11	
pdxB – erythronate-4-phosphate dehydrogenase -	11	
cysC – adenosine 5'-phosphosulfate kinase -	Н	
surA – peptidyl–prolyl cis–trans isomerase -	41	
lysR – positive LysR family transcriptional regulator -	┨┞	
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ilvM – acetolactate synthase II, small subunit -	11	
carB – carbamoyl–phosphate synthase, large subunit -	11	
apaH – diadenosine tetraphosphatase –	1	
argG – argininosuccinate synthetase -	41	
lepA – GTP-binding elongation factor -	41	
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gshA – gamma–glutamate–cysteine ligase -	1	
thrA – aspartokinase I –	11	
ybiB – putative transferase –	11	
aspC – aspartate aminotransferase -	Н	
gnd – gluconate–6–phosphate dehydrogenase -	41	
icc – cyclic 3',5'–adenosine monophosphate phosphodiesterase -	┧┞	
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glnB – regulatory protein (P–II) for nitrogen assimilation by glutamine synthetase (ATase) -	11	
bipA – GTP-binding elongation factor family protein -	11	
thil – sulfur transfer protein (from cys to ThiS and from IscS to U8–tRNA) -	1[	
bioA – 7,8-diaminopelargonic acid synthetasé -	łſ	
galR – transcriptional repressor of galETK operon -	41	
lamB – phage lambda receptor protein -	11	
	11	
cstA – carbon starvation protein –	]  -	
malF – maltose transport protein -	11	
malT – transcriptional activator of the mal genes -	11	
malZ – maltodextrin glucosidase -	Н	
malK – maltose transport protein -	1	
metAS – homoserine transsuccinylase -	11	
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fumA – fumarase A		
malQ – 4-alpha-glucanotransferase ( -	11	
yafV – putative amidohydrolase –	1[	
ompF – outer membrane protein 1a (ia -	1	
metF – 5,10-methylenetetrahydrofolate reductase -	1	
envZ – sensory histidine kinase in two–component regulatory system with OmpR -	11	
sdhE – putative cytoplasmic protein -	J F	
	Jŀ	
ndk – nucleoside diphosphate kinase -	11	
sdhA – succinate dehydrogenase, flavoprotein subunit -	1[	
fadE – putative acyl–CoA dehydrogenase –	11	
sdhB – succinate dehydrogenase, Fe–S protein -	1	
arnE – putative inner membrane protein -	41	
	Jŀ	
sucD – succinyl–CoA synthetase, alpha subunit		
sdhD – succinate dehydrogenase, hydrophobic subunit -	11	
mdh – malate dehydrogenase -	1	
sucC – succinyl–CoA synthetase, beta subunit -	1	
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eda – 2-keto-3-deoxygluconate 6-phosphate aldolase-panC – pantothenate synthetase -xseA – exonuclease VII, large subunit bamB – putative serine/threonine protein kinase bamB – putative serine/threonine protein kinase pfkA – 6-phosphofructokinase I pgi – glucosephosphate isomerase cysD – ATP-sulfurylase, subunit 1 gpmA – phosphoglyceromutase 1 galT – galactose–1-phosphate uridylyltransferase panB – 3-methyl-2-oxobutanoate hydroxymethyltransferase thiD – hydroxy-phosphomethylpyrimidine kinase (HMP-P kinase) galK – galactokinase argD – acetylornithine transaminase argD - acetylornithine transaminase sodA – superoxide dismutase -cysN – ATP–sulfurylase, subunit 1 -yjgA – putative cytoplasmic protein -ilvA – threonine deamtinase speB – agmatinase – pdxB – erythronate–4–phosphate dehydrogenase – thrC – threonine synthase – panE – ketopantoate reductase – ilvD – dihydroxyacid dehydratase – zwf – glucose–6–phosphate dehydrogenase – pdxA – NAD–dependent dehydrogenase/carboxylase – galP – MFS family galactose:proton symporter – ppk – polyphosphate kinase – lysR – positive LysR family transcriptional regulator – prmC – putative protoporphyrinogen oxidase – trpE – anthranilate synthase, component I – surA – peptidyl–prolyl cis–trans isomerase – gshA – gamma–glutamate–cysteine ligase – apaH – diadenosine tetraphosphatase – ptsI – PEP–protein phosphotransferase – purM – phosphoribosylaminoimidazole synthetase – speB - agmatinase purM – phosphoribosylaminoimidazole synthetase – recG – DNA helicase – aroF – 3-deoxy–D-arabinoheptulosonate–7-phosphate synthase – guaB – IMP dehydrogenase – ytfP – putative cytoplasmic protein – mdh – malate dehydrogenase – fliS – repressor of class 3a and 3b operons (RfIA activity) – lepA – GTP-binding elongation factor – purF – amidophosphoribosyltransferase – pgI – putative 3-carboxymuconate cyclase – pgI – putative 3-carboxymuconate cyclase – pstC – high-affinity phosphate transporter – thrA – aspartokinase I – panM – putative acetyltransferase – purM – phosphoribosylaminoimidazole synthetase panM – putative acetyltransferase tolC – outer membrane channel tolC – outer membrane channel – cyoB – cytochrome o ubiquinol oxidase subunit I – purL – phosphoribosylformylglycinamidine synthetase – sdhB – succinate dehydrogenase, Fe–S protein – srmB – ATP–dependent RNA helicase – glnB – regulatory protein (P–II) for nitrogen assimilation by glutamine synthetase (ATase) – metC – cystathionine beta–lyase – sdhA – succinate dehydrogenase, flavoprotein subunit – gnd – gluconate–6–phosphate dehydrogenase – tgt – tRNA–guanine transglycosylase – pyrC – dihydro–orotase – vacB – putative exoribonuclease – bipA – GTP–binding elongation factor family protein – znuB – ABC superfamily high affinity Zn transport protein – znuC – ABC superfamily high affinity Zn transport protein – thil – sulfur transfer protein (from cys to ThiS and from IscS to U8–tRNA) – fumA – fumarase A fumA – fumarase Á ybiB – putative transferase -zur – transcriptional repressor of znuABC operon ytfM – putative outer membrane protein bioD1 - dethiobiotin synthetase yraM – putative transglycosylase - ydcZ – putative inner membrane protein malZ – maltodextrin glucosidase dppA – dipeptide transport protein -uvrB – UvrB with UvrAC is a DNA excision repair enzyme -flagellar biosynthesis protein metAS – homoserine transsuccinylase metAS - Hornosethre transsuccinylase - metB - cystathionine gamma-synthase - nadB - quinolinate synthetase, B protein - nadC - quinolinate synthetase, B protein - nadC - quinolinate phosphoribosyltransferase - pabB - p-aminobenzoate synthetase, component I - glnL - sensory kinase (phosphatase) in two-component regulatory system with GlnG (nitrogen regulator II, NRII) pabÁ – p-aminobenzoate synthetase component II Irp – regulator for Irp regulon and high-affinity branched-chain amino acid transport system glnG – EBP family response regulator in two–component regulatory system with GlnL glnK – regulatory protein P–II 2

amtB – putative Amt family, ammonium transport protein gltD – glutamate synthase, small subunit -gltB – glutamate synthase, large subunit -

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