

**Supplementary Table 2 (A)** Functional categories of *M. succiniciproducens* MBEL55E genes based on the COG database.

Code	Description	<i>Mannheimia succiniciproducens</i> MBEL55E	<i>Pasteurella multocida</i> Pm70	<i>Escherichia coli</i> K-12	<i>Bacillus subtilis</i>
J	Translation, ribosomal structure and biogenesis	<b>145 (6.08%)</b>	148 (7.35%)	166 (3.87%)	151 (3.68%)
K	Transcription	<b>104 (4.36%)</b>	76 (3.77%)	245 (5.71%)	261 (6.37%)
L	DNA replication, recombination and repair	<b>123 (5.16%)</b>	101 (5.01%)	209 (4.87%)	127 (3.10%)
D	Cell division and chromosome partitioning	<b>40 (1.68%)</b>	22 (1.09%)	28 (0.65%)	32 (0.78%)
O	Posttranslational modification, protein turnover, chaperones	<b>84 (3.52%)</b>	80 (3.97%)	117 (2.73%)	90 (2.20%)
M	Cell envelope biogenesis, outer membrane	<b>128 (5.37%)</b>	130 (6.45%)	200 (4.66%)	160 (3.90%)
N	Cell motility and secretion	<b>48 (2.01%)</b>	44 (2.18%)	136 (3.17%)	87 (2.12%)
P	Inorganic ion transport and metabolism	<b>86 (3.61%)</b>	101 (5.01%)	172 (4.01%)	139 (3.39%)
T	Signal transduction mechanisms	<b>35 (1.47%)</b>	44 (2.18%)	140 (3.26%)	122 (2.98%)
C	Energy production and conversion	<b>127 (5.33%)</b>	107 (5.31%)	266 (6.20%)	161 (3.93%)
G	Carbohydrate transport and metabolism	<b>167 (7.01%)</b>	141 (7.00%)	333 (7.76%)	267 (6.51%)
E	Amino acid transport and metabolism	<b>167 (7.01%)</b>	164 (8.14%)	342 (7.97%)	287 (7.00%)
F	Nucleotide transport and metabolism	<b>57 (2.39%)</b>	59 (2.93%)	88 (2.05%)	82 (2.00%)
H	Coenzyme metabolism	<b>80 (3.36%)</b>	96 (4.77%)	117 (2.73%)	107 (2.61%)
I	Lipid metabolism	<b>41 (1.72%)</b>	45 (2.23%)	84 (1.96%)	84 (2.05%)
Q	Secondary metabolites biosynthesis, transport and catabolism	<b>39 (1.64%)</b>	37 (1.84%)	89 (2.08%)	123 (3.00%)
R	General function prediction only	<b>193 (8.10%)</b>	180 (8.94%)	302 (7.04%)	326 (7.95%)
S	Function unknown	<b>167 (7.01%)</b>	165 (8.19%)	255 (5.95%)	212 (5.17%)
-	not in COGs	<b>553 (23.20%)</b>	274 (13.60%)	1000 (23.32%)	1282 (31.3%)
	Total	<b>2384 (100%)</b>	2014 (100%)	4289 (100%)	4100 (100%)

**Supplementary Table 2 (B)** Analysis of the gene duplication in *M. succiniciproducens* genome.

Number of duplications (copies) and list of gene products.

# of duplication (copies)	# of genes	Gene products
1 (2)	167	NqrA, TpiA, MtlD, PotC, LdhA and 162 more gene products
2 (3)	39	OppF, DppD, DppC, DppB and 35 more gene products
3 (4)	17	PtsN, AraH, EutG, NapF, CitT, WcaA, AcrA, OppA, CirA, GloA, NlpD, BtuC, Cof, MhpC, HybA, TbpA, MviM
4 (5)	15	MglA, RbsB, SoxR, RbsK, ArtM, RluA, Gst, MdlB, RfaF, NrfG, MalK, NfnB, MdaB, Tra5, Nema
5 (6)	8	XylB, DctP, AcrR, ArtI, GntT, BisC, TrxA, BaeS
6 (7)	2	MutT, GlpR
7 (8)	3	AraC, SmtA, RhaT
9 (10)	1	PurR
10 (11)	1	FabG
11 (12)	1	ProP
22 (23)	1	LysR
Total	255	

Number of duplicated genes based on the COG categories.

Code	Description	Total genes	Genes with multiple copies
J	Translation, ribosomal structure and biogenesis	145 (6.08%)	<b>31 (4.21%)</b>
K	Transcription	104 (4.36%)	<b>81 (11.01%)</b>
L	DNA replication, recombination and repair	123 (5.16%)	<b>40 (5.43%)</b>
D	Cell division and chromosome partitioning	40 (1.68%)	<b>4 (0.54%)</b>
O	Posttranslational modification, protein turnover, chaperones	84 (3.52%)	<b>36 (4.89%)</b>
M	Cell envelope biogenesis, outer membrane	128 (5.37%)	<b>49 (6.66%)</b>
N	Cell motility and secretion	48 (2.01%)	<b>17 (2.31%)</b>
P	Inorganic ion transport and metabolism	86 (3.61%)	<b>41 (5.57%)</b>
T	Signal transduction mechanisms	35 (1.47%)	<b>24 (3.26%)</b>
C	Energy production and conversion	127 (5.33%)	<b>65 (8.83%)</b>
G	Carbohydrate transport and metabolism	167 (7.01%)	<b>110 (14.95%)</b>
E	Amino acid transport and metabolism	167 (7.01%)	<b>107 (14.54%)</b>
F	Nucleotide transport and metabolism	57 (2.39%)	<b>6 (0.82%)</b>
H	Coenzyme metabolism	80 (3.36%)	<b>16 (2.17%)</b>
I	Lipid metabolism	41 (1.72%)	<b>14 (1.90%)</b>
Q	Secondary metabolites biosynthesis, transport and catabolism	39 (1.64%)	<b>35 (4.76%)</b>
R	General function prediction only	193 (8.10%)	<b>48 (6.52%)</b>
S	Function unknown	167 (7.01%)	<b>12 (1.63%)</b>
(No code)	Not in COGs	553 (23.20%)	<b>0 (0.00%)</b>
	Total	2384 (100%)	<b>736 (100%)</b>