

**Table S1: The representative PEA transferases for constructing phylogenetic tree.**

Origin	Strain	Accession number	Protein name	Reference
<i>Escherichia coli</i>	K12	AAC77075	EptA	[17]
<i>Salmonella enterica</i> Typhimurium	LT2	P36555	EptA	[34]
<i>Acinetobacter baumannii</i>	ATCC 17978	G1CBN7	EptA	[36]
<i>Shigella flexneri</i>	301	A0A0H2VXP0	EptA	[17]
<i>Klebsiella pneumoniae</i>	HS11286	A0A0H3GLS1	EptA	[17]
<i>Helicobacter pylori</i>	26695	ABE02822	EptA	[38]
<i>Pseudomonas aeruginosa</i>	PAO1	Q9HYT4	EptA	[17]
<i>Vibrio cholerae</i>	O1 biovar El Tor N16961	Q9KKK2	EptA	[41]
<i>Neisseria meningitidis</i>	MC58	Q7DD94	EptA	[49]
<i>Neisseria gonorrhoeae</i>	FA1090	KAE9493802	EptA	[17]
<i>Haemophilus ducreyi</i>	35000HP	AAP95743	EptA	[53]
<i>Cronobacter sakazakii</i>	ATCC BAA-894	A7MFE0	ESA_RS09200	[54]
<i>Vibrio parahaemolyticus</i>	RIMD 2210633	VP_RS21300	VP_RS21300	[55]
<i>Pasteurella multocida</i>	AL435	OBP27748	PetL	[18]
<i>Moraxella catarrhalis</i>	BC1	EGE18576.1	ICR	[57]
<i>Moraxella osloensis</i>	CCUG 350	AME01623	ICR	[15]
<i>Escherichia coli</i>	GDP6F1	ATZ71845	MCR-1	[71]
<i>Escherichia coli</i>	KP37	SBV31106	MCR-2	[72]
<i>Escherichia coli</i>	WJ1	WP_104769708	MCR-3	[58]
<i>Salmonella enterica</i> Typhimurium	R3445	ASR73329	MCR-4	[59]

<i>Salmonella enterica</i> Typhimurium	B dTa+ isolate 13-SA01718	WP_229654935	MCR-5	[60]
<i>Moraxella pluranimalium</i>	AM884564	AVA17336	MCR-6	[73]
<i>Klebsiella pneumoniae</i>	SC20141012	WP_104009851	MCR-7	[62]
<i>Klebsiella pneumoniae</i>	KP91	UIX51983	MCR-8	[74]
<i>Salmonella enterica</i> Typhimurium	HUM_TYPH_WA_10_R9_3274	QCC62183	MCR-9	[65]
<i>Enterobacter roggenkampii</i>	WCHER090065	QDO66747	MCR-10	[64]
<i>Pasteurella multocida</i>	AL435	OBP26495	PetK	[18]
<i>Escherichia coli</i>	W3110	Q38J80	EptB	[81]
<i>Salmonella enterica</i> Typhimurium	ATCC14028	UVD93218	EptB	[86]
<i>Yersinia pestis</i>	subsp. Pestis bv. Medievalis	A0A5P8RYF1	EptB	[88]
<i>Campylobacter jejuni</i>	NCTC 11168	Q0PBP9	EptC	[78]
<i>Escherichia coli</i>	K12	P0CB39	EptC	[21]
<i>Salmonella enterica</i> Typhimurium	LT2	Q7CPC0	EptC (CptA)	[22]
<i>Neisseria gonorrhoeae</i>	FA1090	WP_171000415	Lpt3	[99]
<i>Neisseria meningitidis</i>	MC58	WP_118818077	Lpt3	[92]
<i>Pasteurella multocida</i>	P1702	D0EAD9	Lpt3	[56]
<i>Neisseria meningitidis</i>	MC58	C5IWX1	Lpt6	[92]
<i>Neisseria gonorrhoeae</i>	FA19	WP_050162946	Lpt6	[93]
<i>Haemophilus influenzae</i>	Rd	WP_233775356	Lpt6	[91]
<i>Proteus mirabilis</i>	HI4320	B4F0R8	EptC	[95]
<i>Pasteurella multocida</i>	AL435	OBP28286	PetG	[18]
<i>Shigella flexneri</i>	2002017	ADA77030	Lpt-O	[24]

<i>Neisseria gonorrhoeae</i>	FA19	Q9RMJ3	PptA	[30]
<i>Neisseria meningitidis</i>	Z2491	WP_002237381	PptA	[29]
<i>Salmonella enterica</i> Typhimurium	LT2	Q7CPI7	BcsG	[27]
<i>Escherichia coli</i>	K12	P37659	BcsG	[25]
<i>Escherichia coli</i>	K12	P75785	OpgE	[28]
<i>Haemophilus ducreyi</i>	35000HP	AAP95341	PtdA	[53]
<i>Haemophilus ducreyi</i>	35000HP	AAP96378	PtdB	[53]