

Table S8. Plasmids used in study

Plasmid	Description	Construction note	Source
pDONR221	Gateway cloning vector		Thermo Fisher
pExchange-tdk	Bacteroides thetaiotaomicron gene deletion plasmid		Michael Fischbach, UC San Francisco
pGG13	Tn5-kanamycin magic pool		This study
pGG14	mariner-kanamycin magic pool		This study
pHLL212	part1 for Tn5 transposon vector	amplify pJW8 with primers oHL551 and oHL552, then the PCR product was cleaned up with Zymo kit and self ligated using T4 DNA ligase	This study
pHLL213	part1 for mariner transposon vector	amplify pJW20 with primers oHL553 and oHL554, then the PCR product was cleaned up with Zymo kit and self ligated using T4 DNA ligase	This study
pHLL214	part4 for Tn5 transposon vector	amplify pJW54 with primers oHL557 and oHL558, amplify pJW20 with primer oHL561 and oHL562, then the two PCR products are ligated together by Gibson assembly	This study
pHLL214_NN2	barcoded part4 for Tn5 transposon vector	barcoded version of pHLL214 (using golden gate assembly)	This study
pHLL215	part4 for mariner transposon vector	amplify pJW55 with primers oHL557 and oHL558, amplify pJW20 with primers oHL561 and oHL562, then the two PCR products are ligated together by Gibson assembly	This study
pHLL215_NN2	barcoded part4 for mariner transposon vector	barcoded version of pHLL215 (using golden gate assembly)	This study
pHLL216	part2 (kanR promoter from pKMW3)	Gibson assembly of gHL1 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL217	part2 (CatR promoter from pDONR221)	Gibson assembly of gHL2 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL218	part2 (ErmR promoter from pMarA)	Gibson assembly of gHL3 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL219	part2 (AmpR promoter from pMarA)	Gibson assembly of gHL4 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL220	part5_Tn5 (ribD promoter from Delftia sp. GW456-R20)	Gibson assembly of gHL5 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL221	part5_Tn5 (glycerol-3-phosphate acyltransferase promoter from Delftia sp. GW456-R20)	Gibson assembly of gHL6 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL222	part5_Tn5 (dihydrofolate reductase promoter from Brevundimonas sp. GW460-12-10-14-LB2)	Gibson assembly of gHL7 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL224	part5_Tn5 (GFF4136;WP_086486180 promoter from Sphingobium sp. GW456-12-10-14-TSB1)	Gibson assembly of gHL9 in pJW52 (ofeba134 and ofeba137 amplified)	This study

pHLL226	part5_Tn5 (FIG007785 promoter from <i>Rhodanobacter</i> sp. FW104-10B01)	Gibson assembly of gHL11 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL229	part5_mariner (glycerol-3-phosphate acyltransferase promoter from <i>Delftia</i> sp. GW456-R20)	Gibson assembly of gHL14 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL231	part5_mariner (ftsY promoter from <i>Brevundimonas</i> sp. GW460-12-10-14-LB2)	Gibson assembly of gHL16 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL233	part5_mariner (GFF3808;OUC52699 promoter from <i>Sphingobium</i> sp. GW456-12-10-14-TSB1)	Gibson assembly of gHL18 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL235	part5_mariner (dihydrofolate reductase promoter from <i>Rhodanobacter</i> sp. 10B01)	Gibson assembly of gHL20 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL238	part3 (KanR gene from pKMW3)	Gibson assembly of two PCR products: amplify pKMW3 with oHL563 and oHL564, amplify pJW52 with ofeba134 and ofeba137	This study
pHLL24	a mariner transposon vector bearing the ermBP gene from <i>Clostridium perfringens</i>		Stephen B. Melville, Virginia Tech
pHLL240	part5_Tn5 (xseB promoter from <i>Jonquetella anthropi</i> ADV 126, DSM 22815)	Gibson assembly of gHL24 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL242	part5_Tn5 (dnaE promoter from <i>Prevotella multisaccharivorax</i> PPPA20, DSM 17128)	Gibson assembly of gHL26 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL243	part5_Tn5 (kdsB promoter from <i>Prevotella ruminicola</i> 23)	Gibson assembly of gHL27 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL244	part5_mariner (AL1_24670 promoter from <i>Alistipes shahii</i>)	Gibson assembly of gHL28 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL245	part5_mariner (selA promoter from <i>Jonquetella anthropi</i> ADV 126, DSM 22815)	Gibson assembly of gHL29 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL246	part5_mariner (ftsY promoter from <i>Myroides odoratus</i> DSM 2801)	Gibson assembly of gHL30 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL247	part5_mariner (foIC promoter from <i>Prevotella copri</i> DSM 18205)	Gibson assembly of gHL31 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL248	part5_mariner (ftsY promoter from <i>Prevotella ruminicola</i> 23)	Gibson assembly of gHL32 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pHLL254	Tn5-erythromycin magic pool		This study
pHLL255	mariner-erythromycin magic pool		This study
pJW10	part3 (KanR gene from pRL27; contains BsmBI site)	KanR gene amplified from pKMW7 with ofeba108 and ofeba109; Gibson assembly into pML967 (ofeba134 and ofeba137 amplified)	This study

pJW13	part5_Tn5 (transposase promoter from pRL27)	Gibson assembly of gfeba270 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW14	part5_mariner (transposase promoter from pHIMAR)	Gibson assembly of gfeba271 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW16	pML967 with BsbI site removed	derived from pML967; NEB site directed mutagenesis kit with ofeba243 and ofeba244	This study
pJW18	part1_mariner (contains BsmBI site)	PCR amplify from pKMW3 with ofeba257 and ofeba107; Gibson assembly into pML967 (ofeba134 and ofeba137 amplified)	This study
pJW19	part3 (KanR gene from pRL27; no BsmBI site)	derived from pJW10; NEB site directed mutagenesis kit with ofeba273 and ofeba274	This study
pJW20	part1_mariner (no BsmBI site)	derived from pJW18; ; NEB site directed mutagenesis kit with ofeba275 and ofeba276	This study
pJW21	part3 (ErmR gene from pExchange)	amplify ermR from pExchange with ofeba287 and ofeba288; Gibson assembly with pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW23	part5_Tn5 (BT1311 promoter from Bacteroides thetaiotaomicron)	Gibson assembly of gfeba290 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW24	part5_Tn5 (cspB promoter from Corynebacterium glutamicum)	Gibson assembly of gfeba291 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW26	part5_Tn5 (DnaE promoter from Collinsella stercoris)	Gibson assembly of gfeba294 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW27	part5_Tn5 (DnaB promoter from Rhodospirillum rubrum)	Gibson assembly of gfeba295 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW28	part5_mariner (cspB promoter from Corynebacterium glutamicum)	Gibson assembly of gfeba297 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW30	part5_mariner (DnaE promoter from Collinsella stercoris)	Gibson assembly of gfeba300 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW31	part5_mariner (DnaB promoter from Rhodospirillum rubrum)	Gibson assembly of gfeba301 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW32	part5_Tn5 (FolC promoter from Parabacteroides distasonis)	Amplification of oLAM152 and oLAM153 with ofeba302 and ofeba304; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW33	part5_Tn5 (DapF promoter from Ruminococcus gnavus)	Amplification of oLAM158 and oLAM159 with ofeba302 and ofeba305; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study

pJW34	part5_Tn5 (KdsB promoter from <i>Bradyrhizobium japonicum</i>)	Amplification of oLAM176 and oLAM177 with ofeba302 and ofeba307; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW35	part5_mariner (FolC promoter from <i>Parabacteroides distasonis</i>)	Amplification of oLAM152 and oLAM345 with ofeba302 and ofeba313; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW36	part5_mariner (KdsB promoter from <i>Leptotrichia goodfellowii</i>)	Amplification of oLAM262 and oLAM455 with ofeba302 and ofeba318; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW37	part5_Tn5 (FtsY promoter from <i>Bacteroides cellulosilyticus</i>)	Amplification of oLAM106 and oLAM107 with ofeba302 and ofeba303; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW38	part5_Tn5 (KdsB promoter from <i>Leptotrichia goodfellowii</i>)	Amplification of oLAM262 and oLAM263 with ofeba302 and ofeba309; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW39	part5_Tn5 (DapF promoter from <i>Leptospira interrogans</i>)	Amplification of oLAM270 and oLAM271 with ofeba302 and ofeba310; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW40	part5_Tn5 (MurD promoter from <i>Planctomyces brasiliensis</i>)	Amplification of oLAM278 and oLAM279 with ofeba302 and ofeba311; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW41	part5_mariner (FolA promoter from <i>Arthrobacter chlorophenicus</i>)	Amplification of oLAM160 and oLAM353 with ofeba302 and ofeba315; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW42	part5_mariner (DapF promoter from <i>Leptospira interrogans</i>)	Amplification of oLAM270 and oLAM463 with ofeba302 and ofeba319; Gibson assembly in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW43	part5_mariner (BT1311 promoter from <i>Bacteroides thetaiotaomicron</i>)	Gibson assembly of gfeba296 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW46	part5_Tn5 (FtsY promoter from <i>Cellulophaga lytica</i>)	Gibson assembly of gfeba431 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW48	part5_mariner (Lgt promoter from <i>Gillisia limnaea</i>)	Gibson assembly of gfeba434 in pJW52 (ofeba134 and ofeba137 amplified)	This study

pJW49	part5_Tn5 (IspF promoter from <i>Aquiflexum balticum</i>)	Gibson assembly of gfeba435 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW50	part_Tn5 (KdsB promoter from <i>Pontibacter actiniarum</i>)	Gibson assembly of gfeba436 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW51	part5_mariner (Dxs promoter from <i>Belliella baltica</i>)	Gibson assembly of gfeba437 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW52	final holding vector for parts; pJW16 with BsmBI site removed	derived from pJW16, NEB site directed mutagenesis kit with ofeba445 and ofeba446	This study
pJW53	part2-part3 combo (promoter-drug marker; Pthlv and ErmR from pLOR_empty plasmid)	Gibson assembly of ofeba429 and ofeba430 amplified pLOR_empty into pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW54	part4_Tn5 (with BsmBI-compatible region for DNA barcoding; contains GFP)	Amplify gfeba443 with ofeba142 and ofeba143 (#1). Amplify pUC19 with ofeba144 and ofeba145 (#2). Combine #1 and #2 and amplify with ofeba142 and ofeba145 (#3). Gibson assembly #3 with pJW52 (amplified with ofeba247 and ofeba248)	This study
pJW55	part4_mariner (with BsmBI-compatible region for DNA barcoding; contains GFP)	Amplify gfeba444 with ofeba146 and ofeba249 (#1). Amplify pUC19 with ofeba250 and ofeba149 (#2). Combine #1 and #2 and amplify with ofeba146 and ofeba149 (#3). Gibson assembly #3 with pJW52 (amplified with ofeba247 and ofeba248)	This study
pJW64	part2 (apFAB68 promoter)	Gibson assembly of gJW1 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW66	part2 (dnaE promoter from <i>Bacteroides thetaiotaomicron</i>)	Gibson assembly of gJW4 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW70	part5_mariner (MviN/MurJ promoter from <i>Ralstonia</i> sp. UNC404CL21Col IMG taxon ID 2558309150)	Gibson assembly of gJW13 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW71	part5_Tn5 (Lauroyl/myristoyl acyltransferase promoter from <i>Ralstonia</i> sp. UNC404CL21Col IMG taxon ID 2558309150)	Gibson assembly of gJW15 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW74	part5_mariner (Lauroyl/myristoyl acyltransferase promoter from <i>Ralstonia</i> sp. UNC404CL21Col IMG taxon ID 2558309150)	Gibson assembly of gJW16 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW76	part5_Tn5 (Acyl carrier protein promoter from <i>Ralstonia</i> sp. UNC404CL21Col IMG taxon ID 2558309150)	Gibson assembly of gJW18 in pJW52 (ofeba134 and ofeba137 amplified)	This study

pJW78	part2 (Lig promoter from <i>Bacteroides thetaiotaomicron</i>)	Gibson assembly of gJW20 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW79	part5_mariner (dTDP-4-amino-4,6-dideoxygalactose transaminase promoter from <i>Echinicola vietnamensis</i> KMM 6221, DSM 17526)	Gibson assembly of gJW59 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW8	part1_Tn5 (most of Tn5 transposase gene, one IR end, R6K origin of replication)	Gibson assembly of ofeba256 and ofeba105 amplified pKMW7 into pML967 (amplified with ofeba134 and ofeba137)	This study
pJW81	part5_mariner (Glycosyltransferase promoter from <i>Echinicola vietnamensis</i> KMM 6221, DSM 17526)	Gibson assembly of gJW61 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW82	part2 (Glycosyltransferase promoter from <i>Echinicola vietnamensis</i> KMM 6221, DSM 17526)	Gibson assembly of gJW62 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW84	part5_mariner (Glycosyltransferase promoter from <i>Pontibacter actiniarum</i>)	Gibson assembly of gJW65 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW85	part2 (Glycosyltransferase promoter from <i>Pontibacter actiniarum</i>)	Gibson assembly of gJW66 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW86	part5_mariner (rfaG promoter from <i>Pontibacter actiniarum</i>)	Gibson assembly of gJW67 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW9	part2 (tetA promoter from pKMW7)	Gibson assembly of Part2_KanP_pRL27_gBLOCK in pML967 (ofeba134 and ofeba137 amplified)	This study
pJW90	part5_Tn5 (dTDP-4-amino-4,6-dideoxygalactose transaminase promoter from <i>Echinicola vietnamensis</i> KMM 6221, DSM 17526)	Gibson assembly of gJW23 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW91	part5_Tn5 (Glycosyltransferase promoter from <i>Echinicola vietnamensis</i>)	Gibson assembly of gJW24 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pJW93	part5_Tn5 (Glycosyltransferase promoter from <i>Pontibacter actiniarum</i>)	Gibson assembly of gJW26 in pJW52 (ofeba134 and ofeba137 amplified)	This study
pKMW3	mariner delivery vector derived from pMiniHimar_RB1	PMID 25968644	Our lab
pKMW7	Tn5 delivery vector derived from pRL27	PMID 25968644	Our lab
pLOR_empty	<i>Clostridium-E.coli</i> vector	PMID 27836845	Wenjun Zhang, UC Berkeley
pMarA	a mariner transposon vector bearing the ermC gene from the <i>Staphylococcus aureus</i> plasmid pE194	PMID 16391061	Bacillus Genetic Stock Center (http://www.bgsc.org/)

pML967	colE1 origin of replication, GFP, chlorR		John Dueber, UC Berkeley
pMob-efgpErmCat-aspSac-pigEKO	a plasmid contains the ermB gene from the streptococcal shuttle plasmid pVA838		Jay Keasling, UC Berkeley
pTGG37	mariner transposon delivery vector; golden gate assembly product of pHLL213, pHLL219, pHLL238, pHLL215, pHLL229		This study
pTGG37_NN1	fully barcoded version pTGG37		This study
pTGG39	mariner transposon delivery vector; golden gate assembly product of pHLL213, pHLL219, pHLL238, pHLL215, pHLL233		This study
pTGG39_NN1	fully barcoded version pTGG39		This study
pTGG43	mariner transposon delivery vector, golden gate assembly product of pHLL213, pJW66, pYS14, pHLL215, pJW51		This study
pTGG43_NN2	fully barcoded version of pTGG43		This study
pUC19	standard cloning vector		Our lab
pYS12	part3 (ErmR erythromycin resistance gene from pLOR_empty)	Gibson assembly of oJW93 and oJW80 amplified pJW53 into pJW52 (ofeba134 and ofeba137 amplified)	This study
pYS13	part3 (ErmR erythromycin resistance gene from pMob-efgpErmCat-aspSac-pigEKO)	Gibson assembly of oJW95 and oJW90 amplified pMob-efgpErmCat-aspSac-pigEKO into pJW52 (ofeba134 and ofeba137 amplified)	This study
pYS14	part3 (ErmBP erythromycin resistance gene from pHLL24)	Gibson assembly of oJW97 and oJW98 amplified pHLL24 into pJW52 (ofeba134 and ofeba137 amplified)	This study
pYS16	part3 (ErmR erythromycin resistance gene from pMarA)	Gibson assembly of oJW94 and oJW82 amplified pMarA into pJW52 (ofeba134 and ofeba137 amplified)	This study