

## Supporting Information

**Table S1. Strains and Plasmids**

Plasmids or strains	Description	Antibiotic Resistance	Reference
<i>Strains</i>			
<i>E. coli</i>			
HB101	F <sup>-</sup> Δ( <i>gpt-proA</i> )62 <i>leuB6 supE44 ara-14 galK2 lacY 1</i> Δ ( <i>mcrC-mrr</i> ) <i>rpsL20</i> (Str <sup>R</sup> ) <i>xyl-5 mtl-1recA13</i>	Str <sup>R</sup>	Promega
XL1-Blue	F <sup>'</sup> ::Tn10 <i>proA<sup>+</sup>B<sup>+</sup> lacIq</i> Δ( <i>lacZ</i> )M15/ <i>recA1 endA1 gyrA96</i> (NaI <sup>R</sup> ) <i>thi hsdR17 (r<sub>K</sub><sup>-</sup>m<sub>K</sub><sup>+</sup>) supE44 relA1 lac</i>	Amp <sup>R</sup>	Stratagene
<i>R. capsulatus</i>			
MT-RBC1	Δ( <i>petABC::spe</i> )	Spe <sup>R</sup>	(28)
BK-RBC1	Δ( <i>petABC::spe</i> ) Δ( <i>recA::gen</i> )	Spe <sup>R</sup> Gen <sup>R</sup>	This work
<i>Plasmids</i>			
pBluescript II	Cloning vector (pBS)	Amp <sup>R</sup>	Stratagene
pRK2013	Conjugation helper	Kan <sup>R</sup>	(52)
pRK415	Broad host-range vector	Tet <sup>R</sup>	(52)
pPETI-S	3.4 kb fragment of <i>petABC</i> operon in pBR322 with <i>petB</i> tagged with Strep tag	Amp <sup>R</sup>	(22)
pPETI-F	3.4 kb fragment of <i>petABC</i> operon in pBR322 with <i>petB</i> tagged with Flag tag	Amp <sup>R</sup>	(22)
pWX1	1.9 kb of <i>recA</i> region in pBS	Amp <sup>R</sup>	This work
pWX2	Δ( <i>recA::gen</i> ) allele with a <i>gen</i> cassette inserted between the SmaI and HindIII sites of <i>recA</i>	Amp <sup>R</sup> Gen <sup>R</sup>	This work
pWX3	2 kb <i>gen</i> cassette inactivating <i>recA</i> Δ( <i>recA::gen</i> ) in pRK415	Tet <sup>R</sup> Gen <sup>R</sup>	This work
<i>One Plasmid system</i>			
pBK7	Fragment of NotI linker fused to <i>petB</i> and <i>petC</i> genes in pBS	Amp <sup>R</sup>	This work
pBK8	Fragment of NotI linker fused to <i>petB</i> and	Amp <sup>R</sup>	This work

pBK6	<i>petA</i> genes in pBS 4.9 kb <i>petAB1<sup>wt</sup>B2<sup>wt</sup>C</i> in pRK415- derivative; <i>petB2</i> is tagged with the Strep epitope ( <i>petB2-S</i> )	Kan <sup>R</sup>	This work
pBK22	Fragment of NotI linker fused to <i>petB::F144R</i> and <i>petA</i> in pBS	Amp <sup>R</sup>	This work
pBK27	Fragment of NotI linker fused to <i>petB::H217L</i> and <i>petC</i> s in pBS	Amp <sup>R</sup>	This work
pBK32	4.9 kb <i>petAB1<sup>F144R</sup>B2<sup>H217L</sup>C</i> in pRK415- derivative; <i>petB2::H217L</i> is tagged with the Strep epitope ( <i>petB2-S</i> )	Kan <sup>R</sup>	This work
<i>Two plasmids system</i>			
pMTS1-S	3.4 kb fragment of <i>petABC</i> in pRK415; <i>petB</i> is tagged with the Strep epitope ( <i>petB-S</i> )	Kan <sup>R</sup>	(22)
pBK21	3.4 kb fragment of <i>petABC</i> in pRK415; <i>petB</i> is tagged with the Flag epitope ( <i>petB-F</i> )	Tet <sup>R</sup>	This work
pBK18	3.4 kb fragment of <i>petAB<sup>H217L</sup>C</i> in pPETI- F; <i>petB::H217L</i> is tagged with the Flag epitope ( <i>petB-F</i> )	Amp <sup>R</sup>	This work
pBK19	3.4 kb fragment of <i>petAB<sup>F144R</sup>C</i> in pPETI- S; <i>petB::F144R</i> is tagged with the Strep epitope ( <i>petB-S</i> )	Amp <sup>R</sup>	This work
pBK25	3.4 kb fragment of <i>petAB<sup>F144R</sup>C</i> in pRK415; <i>petB::F144R</i> is tagged with the Strep epitope ( <i>petB-S</i> )	Kan <sup>R</sup>	This work
pBK28	3.4 kb fragment of <i>petAB<sup>H217L</sup>C</i> in pRK415; <i>petB::H217L</i> is tagged with the Flag epitope ( <i>petB-F</i> )	Tet <sup>R</sup>	This work

The *petB* is carboxyl-terminally epitope-tagged with Strep (*petB-S*) or Flag (*petB-F*) tags. Str<sup>R</sup>, Amp<sup>R</sup>, Spe<sup>R</sup>, Gen<sup>R</sup>, Kan<sup>R</sup>, Tet<sup>R</sup> correspond to streptomycin, ampicillin, spectinomycin, gentamicin, kanamycin and tetracycline resistance, respectively.

**Table S2. Ps and Res colony forming abilities of strains producing mutant cytochrome *bc*<sub>1</sub> heterodimers.** A, one-plasmid system, B two-plasmids system. See **Table S1** for strain descriptions.

A.

Strain	Medium	Dilution 10 <sup>-4</sup>		Dilution 10 <sup>-5</sup>		Dilution 10 <sup>-6</sup>	
		*Large (Ps)	Total (Res)	*Large (Ps)	Total (Res)	*Large (Ps)	Total (Res)
pBK6/MT-RBC1	MPYE	47	1725	3	462	0	63
	Med A	60	2818	10	444	1	43
pBK6/BK-RBC1	MPYE	2	1558	1	242	0	38
	Med A	1	1460	0	211	0	32

\*Large (Ps<sup>+</sup>) colonies obtained under Ps, and Total (Res), total numbers of colonies obtained under Res growth conditions; numbers indicate colony forming units (cfu)/ml

B.

Strain	Dilution 10 <sup>-2</sup>		Dilution 10 <sup>-3</sup>		Dilution 10 <sup>-4</sup>		Dilution 10 <sup>-5</sup>	
	**Large (Ps)	Total (Ps)	Large (Ps)	Total (Ps)	Large (Ps)	Total (Ps)	Large (Ps)	Total (Ps)
pBK25 + pBK28/MT-RBC1								
cyt <i>b</i> -S:F144R+cyt <i>b</i> -F: H217L	0	NC	1	NC	0	NC	0	782
pBK25 + pBK28/BK-RBC1								
cyt <i>b</i> -S:F144R+cyt <i>b</i> -F: H217L	1	NC	0	1158	0	184	0	13

\*\*Large (Ps<sup>+</sup>) colonies obtained under Ps, and Total (Ps) total numbers of colonies (*i.e.*, large and small) obtained under Res growth conditions; numbers indicate colony forming units (cfu)/ml; NC, not counted (too many colonies).